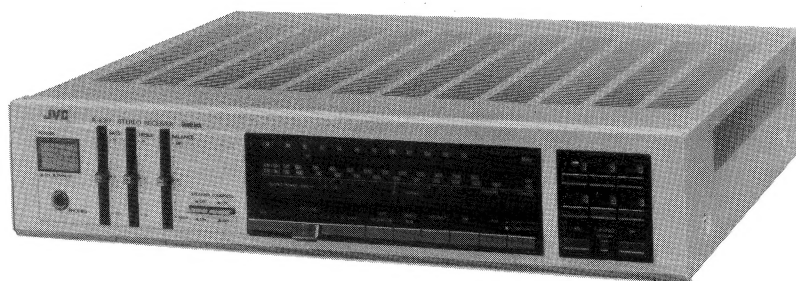


JVC

SERVICE MANUAL

MODEL
R-K20/R-K20L

SYNTHESIZER STEREO RECEIVER



No. 2604
Mar. 1982

Contents

1. Specifications	1	11. Accessories List	17
2. Names of Parts and Their Functions	2 - 3	12. R-K20/R-K20L Schematic Diagrams	18 - 22
3. Block Diagram	3	12-(1) R-K20 Tuner Section	18
4. Removal Procedures	4	12-(2) R-K20 Tuner Section (for West Germany only)	19
4-(1) Removing the Bottom Cover	4	12-(3) R-K20L Tuner Section (for Europe and U.K.)	20
4-(2) Removing the Power Transistors	4	12-(4) R-K20 Amplifier Section	21
5. Rear View and Part Numbers	4	12-(5) R-K20L Amplifier Section (for Europe and U.K.)	22
6. Exploded View and Part Numbers	5	13. Parts List with Specified Numbers for Designated Areas	23
7. FM/AM (MW/LW) Tuner Alignment Procedures	6 - 7	14. Repair of Printed Resistor	23
8. Power Amplifier Idling Current Adjustment Procedure	7		
9. Printed Circuit Board Ass'y and Parts List	8 - 16		
9-(1) TFC-39 Tuner P.C. Board Ass'y	8 - 11		
9-(2) TDC-64 Logic P.C. Board Ass'y	12 - 13		
9-(3) TXX-400 Amplifier P.C. Board Ass'y	14 - 16		
10. Packing Materials and Part Numbers	17		

1. Specifications

FM Tuner Section

	IHF	DIN 45 500
Tuning Range	: 87.5 MHz - 108.0 MHz	: 87.5 MHz - 108.0 MHz (S/N 26 dB)
Usable Sensitivity	: Mono 10.3 dBf	: Mono 0.8 μ V/75 Ω Mono 1.6 μ V/300 Ω
50 dB Quieting Sensitivity	: Mono 14.8 dBf (3.0 μ V/300 Ω) Stereo 38.3 dBf (45 μ V/300 Ω)	—
S/N 46 dB Stereo Sensitivity	: —	: Stereo 23 μ V/75 Ω Stereo 46 μ V/300 Ω
Signal to Noise Ratio (at 98 MHz)	: Mono 80 dB Stereo 73 dB (A-net.)	: Mono 72 dB Stereo 63 dB (weighted)
Total Harmonic Distortion 1 kHz	: Mono 0.15 % Stereo 0.3 %	: Mono 0.15 % Stereo 0.4 %
Frequency Response	: 30 Hz - 12.5 kHz, +0.5 dB, -3 dB	
Capture Ratio	: 1.5 dB	: 1.0 dB
Alternate Channel Selectivity	: 65 dB, \pm 400 kHz	: 55 dB, \pm 300 kHz
Image Response Ratio	: 56 dB at 98 MHz	
IF Response Ratio	: 80 dB at 98 MHz	
Stereo Separation	: 45 dB at 1 kHz	: 40 dB at 1 kHz

MW Tuner Section

	IHF	DIN 45 500
Tuning Range	: 520 - 1710 kHz (channel spacing 10 kHz)	: 522 - 1611 kHz (channel spacing 9 kHz)
Sensitivity	: 300 μ V/m	
Signal to Noise Ratio	: 50 dB	
Selectivity at 1000 kHz	: 40 dB, \pm 10 kHz	: 36 dB, \pm 9 kHz

Power Specifications

Areas	Line Voltage & Frequency	Power Consumption
U.S.A., Canada	AC 120 V, 60 Hz	145 W, 200 VA
Europe	AC 220 V~, 50 Hz	380 W
U.K., Australia	AC 240 V~, 50 Hz	380 W
Other Areas	AC 110/120/220/240 V~, Selectable, 50/60 Hz	380 W

Dimensions and Weight

Dimensions			Weight
Height	Width	Depth	Net
92 mm (3-5/8")	435 mm (17-1/8")	346 mm (13-5/8")	5.7 kg (12.6 lbs.)

LW Tuner Section

	DIN 45 500
Tuning Range	: 153 kHz - 360 kHz
Usable Sensitivity	: 700 μ V/m,
Signal to Noise Ratio	: 45 dB
Selectivity	: 40 dB, \pm 9 kHz

Amplifier Section

RMS Power: 30 watts per channel, min. RMS, both channels driven, into 8 ohms from 20 Hz to 20 kHz, with no more than 0.03 % total harmonic distortion.

33 watts per channel, min. RMS, both channels driven, into 8 ohms at 1 kHz with no more than 0.008 % total harmonic distortion.

35 watts per channel at 1 kHz into 8 ohms 0.7 % total harmonic distortion.

Input/Sensitivity/Impedance

PHONO	: 2.5 mV/47 kohms
TAPE PLAY 1, 2	: 120 mV/40 kohms
TAPE PLAY 1 (DIN)	: 120 mV/40 kohms

Tone Control

Bass	: \pm 8 dB at 100 Hz
Treble	: \pm 8 dB at 10 kHz

	IHF	DIN 45 500
Signal to Noise Ratio	: (Weighted by IHF "A" net-work)	: (To 50 mW power output weighted)
PHONO	: 78 dB (New IHF, Rec out)	: 59 dB
TAPE PLAY, VIDEO/AUX	: 74 dB (New IHF)	: 64 dB

Warning:

When replacing the parts marked with \triangle , be sure to use the designated parts to ensure safety.

2. Names of Parts and Their Functions

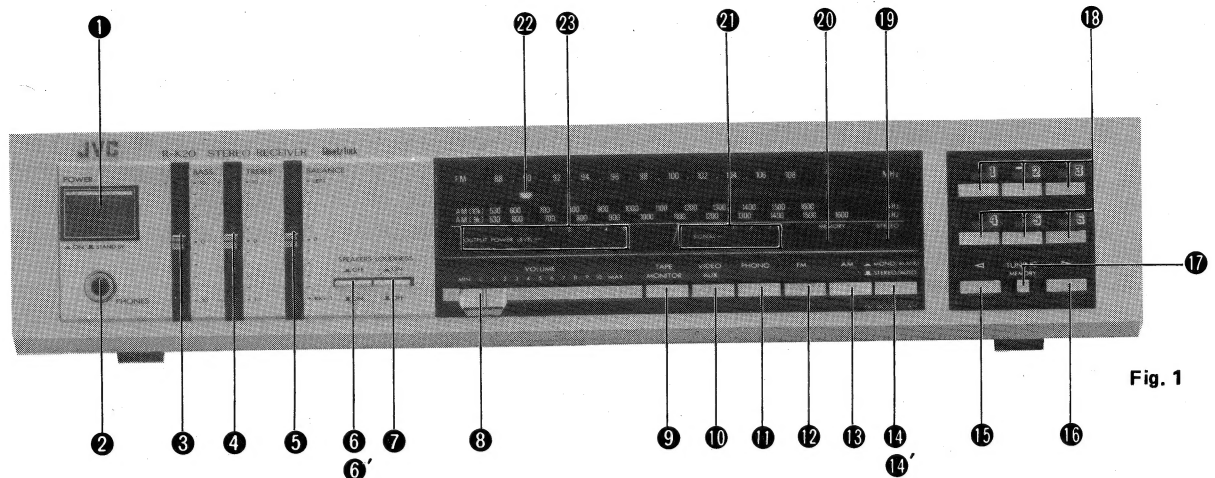


Fig. 1

1 Power switch

ON: Press to turn the power on. During the first 3 or 4 seconds after the POWER switch is turned on, no sound will be heard until you hear the "click" of the relay operation. This is not due to any defect in the unit, but due to the power protection circuit muting switching noise for speaker protection.

STAND BY: When the power cord is plugged into an AC outlet, the preset stations are not cancelled or altered. The preset data are maintained even in the case of a power failure or when the power cord is disconnected, if the period of non-applied power does not exceed a couple of days.

2 Headphone jack (PHONES)

Plug stereo headphones into this jack for private listening and recording monitoring. For R-K20: If you want to listen to sound from the headphones only, press the SPEAKERS switch 6 to its OFF position.

3 BASS control

Slide up to boost bass response, and slide down to decrease it.

4 TREBLE control

Slide up to boost treble response and slide down to decrease it.

5 BALANCE control

Use to adjust the balance between the left and right speakers. When moved all the way up, you will hear only the left channel; when moved all the way down, you will hear only the right channel.

6 SPEAKERS switch (R-K20 only)

This switch turns on and off the speakers. When you want to listen to the sound from headphones only, set this switch to its OFF position.

6' FM MODE/SCAN switch (R-K20L only)

This switch is used to select both STEREO/MONO mode and AUTO/MANUAL scanning mode. These functions are related to each other. When stereo reception is possible, set this switch to STEREO/AUTO (■) for auto tuning. When signals are too weak to be received, set to MONO/MANU (—) for manual tuning; in this mode the FM left and right channel signals are mixed and heard from both speakers.

7 LOUDNESS switch

At low volumes, the tone of sound appears to change. This is not due to any change in the sound itself, but due to the ear's different sensitivity to sound at low volumes. Press to compensate for this when you are listening at low volumes.

8 VOLUME control

Slide to the right to increase the sound level.

9 TAPE MONITOR switch

Press to listen to the tape deck connected to the TAPE terminals. Release the switch to hear the source selected with the source select switches.

10 VIDEO/AUX switch

Press to hear sound from the source connected to the VIDEO/AUX terminals on the rear panel.

11 PHONO switch

Press to hear or record sound from the turntable connected to the PHONO terminals on the rear panel.

12 FM switch

Press to switch on the FM tuner section.

13 AM (MW) switch

Press to switch on the AM (MW) tuner section.

14 LW switch (R-K20L only)

Press to switch on the LW tuner section.

14' FM MODE/SCAN switch (R-K20 only)

See No. 6'.

15 16 TUNING buttons

Auto Tuning

Up-scanning button (▶): Press this momentarily to start automatic scanning to higher frequencies. When scanning is taking place, beeps will be heard and the LEDs in the tuning dial will indicate increasing frequencies. When a station is received, scanning stops and the LED lit in the dial scale indicates its frequency. Auto scan tuning will not stop when the station is not strong enough for good reception. When the top frequency in the waveband selected is reached, scanning starts in the opposite direction. If you continue to press the scanning button when the top frequency has been reached, scanning will stop at the top frequency. When this button is held pressed, scanning does not stop even if there are stations.

Down-scanning button (◀): Press momentarily to scan to lower frequencies. Its operation is exactly the same as in up-scanning.

Manual tuning

Manual tuning is used when the station required is too weak to be received by auto tuning. Press the MODE/SCAN switch ⑥' (R-K20L)/⑭' (R-K20). Now pressing the scanning buttons changes the frequency in predetermined steps (FM: 100 kHz U.S.A. and Canada, 50 kHz other countries; AM (MW): 10 kHz U.S.A. and Canada, 9 kHz other countries). Tapping the scanning button changes the frequency in single steps, holding it changes frequency continuously; when the button is released, scanning stops.

Note:

When manual tuning is used, it does not automatically reverse the direction of scanning when the upper or lower frequency limit is reached.

⑰ MEMORY switch

Press this switch and the memory indicator will light to show that this unit is ready to receive a memory setting. Pressing the station select button while the MEMORY indicator is lit (for about 10 sec.) makes it possible to memorize the station being received. When the MEMORY indicator is not lit, the memory function does not operate.

⑱ Station select buttons

These buttons are used to select one of the preset stations or to memorize a frequency in a channel. If one of these buttons is pressed after the MEMORY switch ⑰ has been pressed, the station which is being received will be stored in memory. Each of the station select buttons can be used for one FM station and one AM (MW/LW) station. When the MEMORY indicator is not lit, press one of these buttons, a beep will be heard, to receive the station held in memory;

Notes:

- Do not leave unmemorised preset channels as this may cause mistuning.

- Do not press the MEMORY switch and the preset button at the same time. Be sure to release the MEMORY switch and then press the preset button.
- When storing in memory, a beep is not heard when the station select button is pressed.

⑲ FM STEREO indicator

This LED lights when an FM stereo broadcast is tuned in.

⑳ MEMORY indicator

When the MEMORY switch is pressed, this MEMORY indicator lights to show that the unit is ready to register the preset station to memory. This indicator will go out automatically in about 10 sec. or when the station select button is pressed.

㉑ SIGNAL strength indicator

This is used in tuning to both FM and AM broadcasts. The more LEDs light, the stronger the signal being received.

㉒ Tuning dial LED

The tuned-in frequency is displayed by this LED.

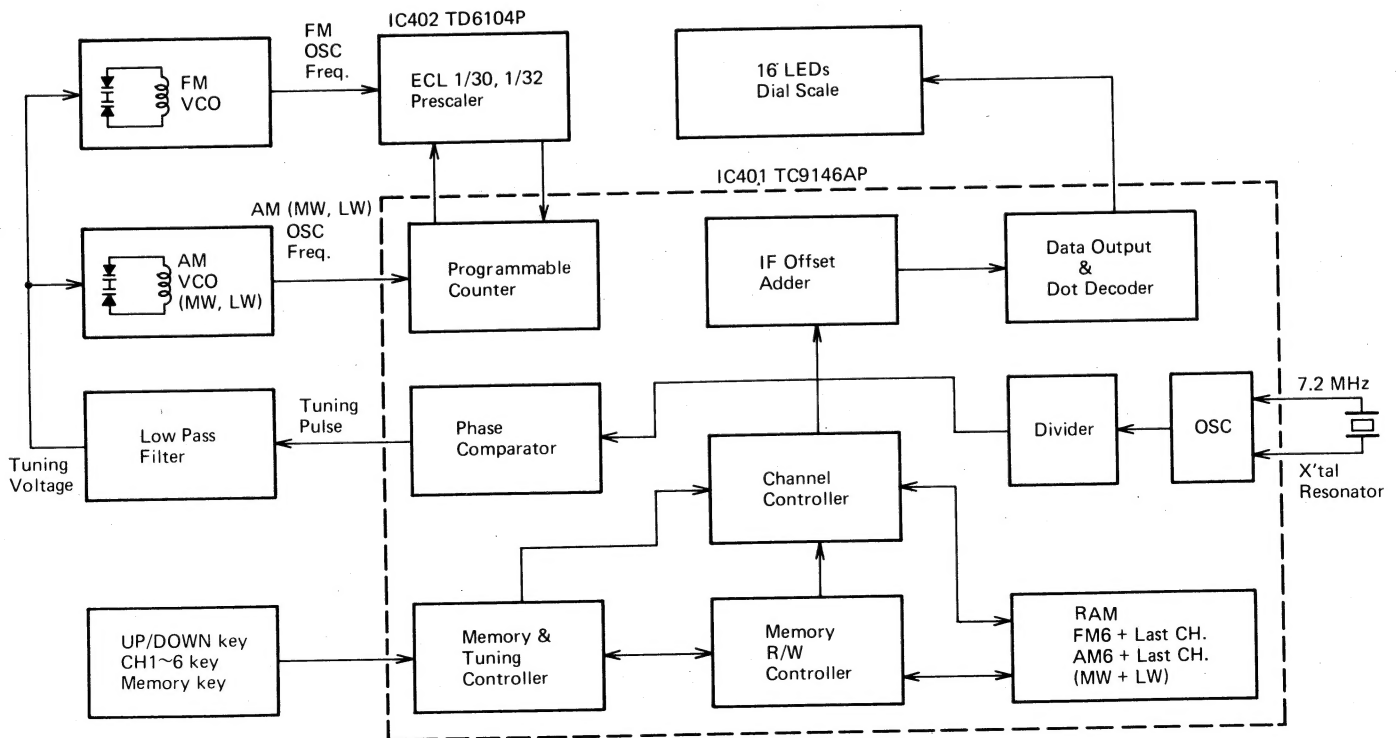
Notes:

- One LED covers 16 channels in FM (U.S.A. and Canada), covers 32 channels in FM (Europe and other countries) and 8 channels in AM (MW). Therefore, a single LED may correspond to more than one station.
- Both 9 kHz and 10 kHz AM dial scale channel spacing steps are printed on sets for the U.S.A., Canada and some other countries. If you channel spacing steps are 9 kHz, use the 9 kHz tuning dial scale.
- The receivable frequency range for one LED is 1.6 MHz for FM, 72 kHz (9 kHz channel spacing steps) and 80 kHz (10 kHz channel spacing steps) for AM (MW).
- One LED covers 16 channels (1 kHz channel spacing steps) in LW (R-K20L).

㉓ OUTPUT LEVEL indicator

These LED's indicate the output level.

3. Block Diagram



Block Diagram of PLL Synthesizer

Fig. 2

4. Removal Procedures

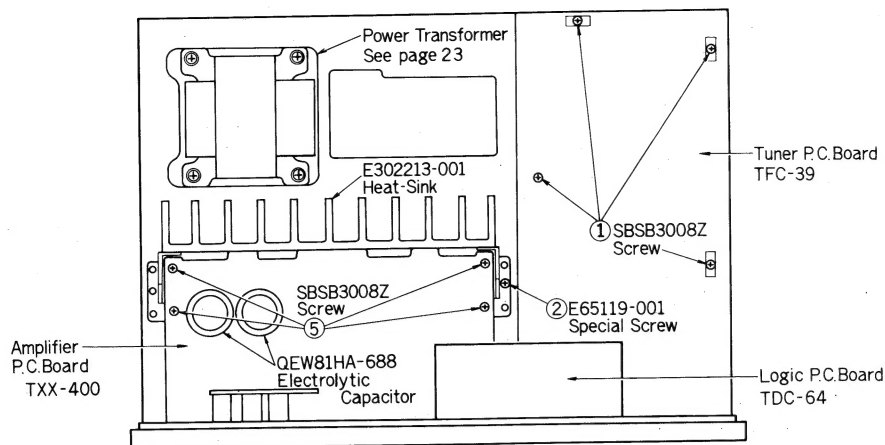


Fig. 3

4-(1) Removing the Bottom Cover

- Step 1: Remove 5 screws ①, ②. (Fig. 3)
 Step 2: Remove 11 screws ③. (Fig. 4)
 Step 3: Remove the Fuse P.C. Board Ass'y ④ from fasteners and replace the Bottom Cover.

4-(2) Removing the Power Transistors

- Step 1 — Step 3
 Step 4: Resolder the power transistor's leads.
 Step 5: Remove 4 screws ⑤ (Fig. 3) and heat-sink from Main Amp. P.C. Board Ass'y and then replace the transistors.

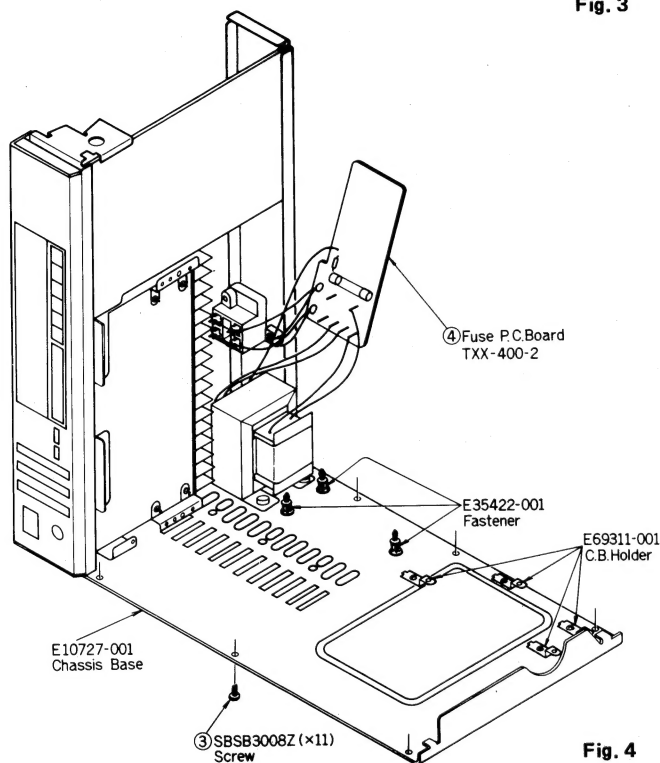


Fig. 4

5. Rear View and Part Numbers

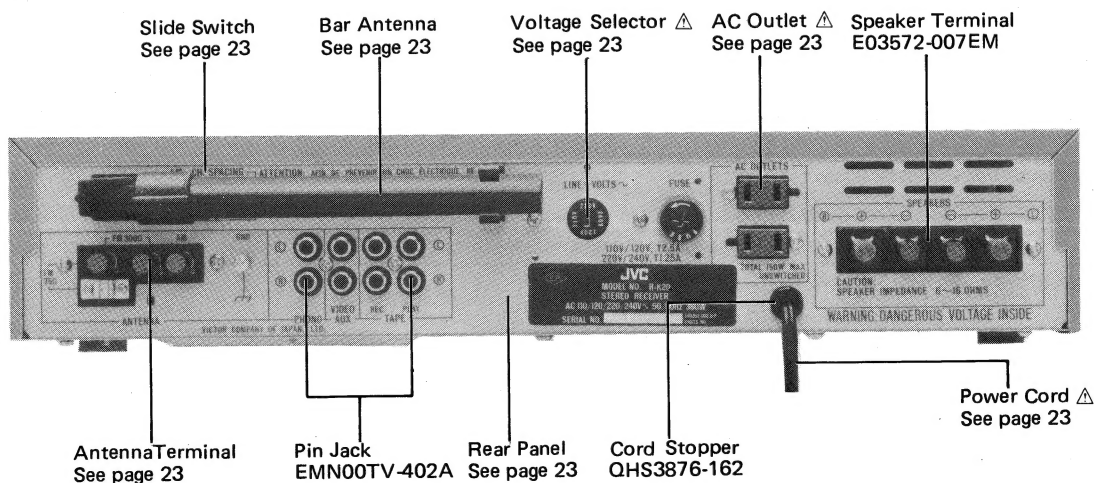


Fig. 5

6. Exploded View and Part Numbers

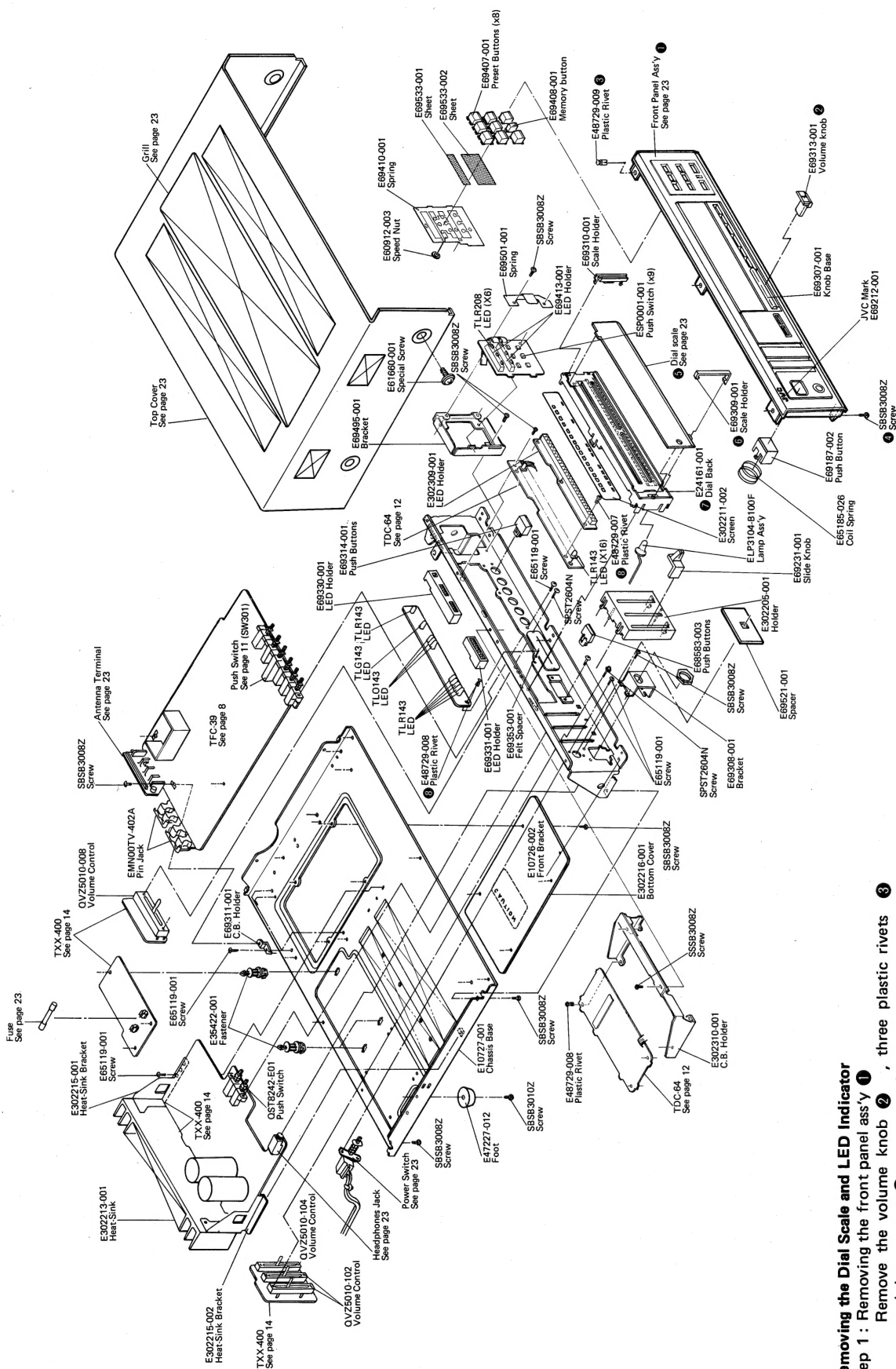
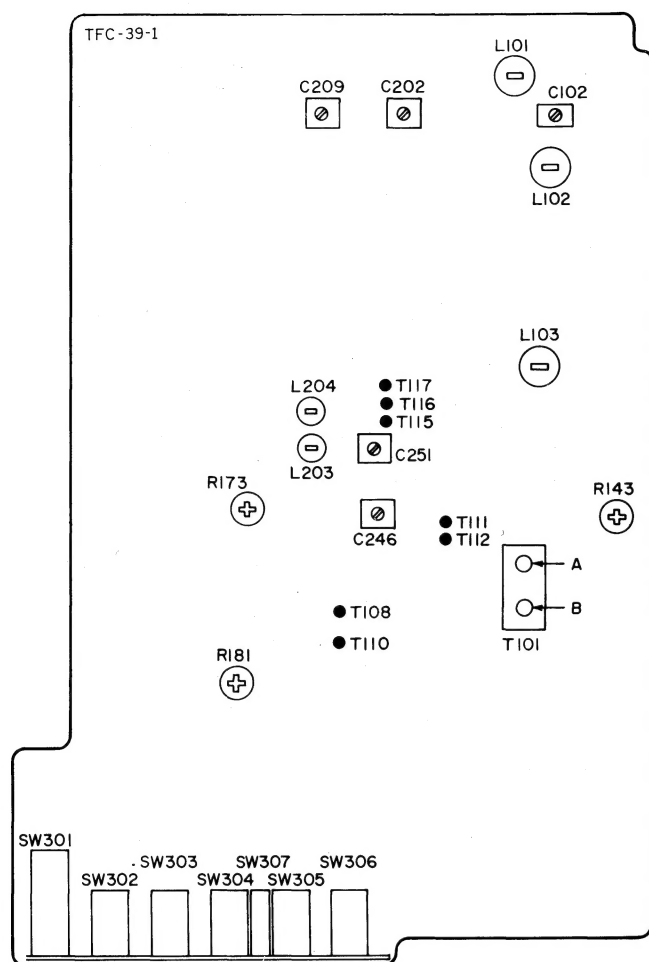


Fig. 6

Removing the Dial Scale and LED Indicator

- Step 1:** Removing the front panel ass'y
Remove the volume knob ②, three plastic rivets ③ and three screws ④.
- Step 2:** Removing the dial back ⑦
Remove the scale holder ⑥ and then, pull out the dial scale ⑤ and dial back ⑦.
- Step 3:** Removing the LED indicator
Remove three (or four) plastic rivet ⑧.

7. FM/AM (MW/LW) Tuner Alignment Procedures



Band Cover

1. Tune to the highest frequency channel, 108.0 MHz.
2. Connect a DC VTVM to test points 117 and 115.
3. Adjust L103 so that the VTVM shows 8.00 V.
4. And tune to the lowest frequency channel, 87.5 MHz.
5. Check the VTVM reads 1.65 ± 0.5 V.

Sensitivity

Low Frequency

1. Connect an RF generator to the antenna terminals on the rear panel through a dummy antenna.
2. Set an RF generator to 90 MHz, a modulation of 1 kHz and a deviation of 75 kHz to provide an input of $2 \mu\text{V}$.
3. Connect a VTVM and an oscilloscope to the Rec. out jacks on the rear panel.
4. Tune to 90 MHz.
5. Adjust coils L101, L102 to maximize the output.

High frequency

6. Set the RF generator to 106 MHz, a modulation of 1 kHz and a deviation of 75 kHz to provide an input of $2 \mu\text{V}$.
7. Tune to 106 MHz.
8. Adjust the FM trimmers C102 to maximize the output.
9. Repeat these high and low frequencies adjustment alternately until maximum sensitivity is obtained.

Discriminator, Distortion and Signal Gain

1. Press to FM position.
2. Connect an RF generator, 1 kHz modulation and 75 kHz deviation to the antenna terminals on the rear panel through a dummy antenna.
3. Connect an oscilloscope, Distortion Meter and VTVM to the Rec. out jacks on the rear panel.
4. Set the RF generator to 98 MHz, generator output to minimize.
5. Tune to 98 MHz.
6. Connect a DC VTVM to test points 111 and 112.
7. Adjust the core indicated allow A of T101 for DC VTVM reading of 0 (zero) mV.
8. And set the RF generator output to 1 mV.
9. Adjust the core indicated allow B of T101 so that the distortion is minimized.

Multiplex and Stereo Separation

Multiplex

1. Set the stereo signal generator as follows: 400 Hz modulation frequency, 7.5 kHz deviation pilot, 67.5 kHz main and sub carriers. Connect its output to the RF generator.
2. Connect an RF generator to the antenna terminals through a dummy antenna.
3. Connect a VTVM, an oscilloscope and a distortion meter to the Rec. out jacks on the rear panel.
4. Set the RF generator to 98 MHz and output of 1 mV.
5. Tune to 98 MHz.
6. Connect the frequency counter to test point 108.
7. Switch off the pilot signal of stereo modulator.
8. Adjust R181 so that the frequency counter indicates 19 kHz (0 ~ -50 Hz).

Stereo Separation

9. Switch the selector of stereo modulator to left channel modulation.
10. Adjust R173 so that the output of right channel is minimized.
11. Switch the selector of the modulator to right channel modulation.
12. Adjust R173 so that the left channel is minimized.
13. Set R173 to a average, if the separation of left and right is different.

Stereo threshold

14. Adjust R143 so that STEREO indicator lights at the output of RF generator $10 \mu\text{V}$.

AM (MW) Section

Band Cover

1. Press to AM (MW) position.
2. Tune to the lowest frequency channel, 520 kHz (10 kHz channel step), or 522 kHz (9 kHz channel step).
3. Connect DC VTVM to test points 117 and 115.
4. Adjust L203 so that the VTVM shows 0.85 V.
5. And tune to the highest frequency channel, 1710 kHz (10 kHz channel step), or 1611 kHz (9 kHz channel step).
6. Adjust C246 so that the DC VTVM reads 9.00 V for 1710 kHz, or 7.50 V for 1611 kHz.

Tracking and Sensitivity

1. Connect the RF generator to the antenna terminal on the rear panel.
2. Set the generator to 600 kHz (or 603 kHz) with 30 % modulation at 400 Hz.
3. Tune to 600 kHz, or 603 kHz.
4. Adjust the core of ferrite bar antenna to maximize the output.
5. Set the generator to 1400 kHz, or 1404 kHz.
6. Tune to 1400 kHz, or 1404 kHz.
7. Adjust C202 so that the output signal is maximized.
8. Repeat these adjustments (1 ~ 7) alternately until maximum sensitivity is obtained.

LW Section

Band Cover

1. Press to LW position.
2. Tune to the lowest frequency channel, 153 kHz.
3. Connect a DC VTVM to test points 116 and 115.
4. Adjust L204 so that the VTVM shows 1.10 V.
5. Tune to the highest frequency channel, 360 kHz.
6. Adjust C251 so that the VTVM. reads 8.00 V.

Tracking and Sensitivity

1. Connect the RF generator to the antenna terminal on the rear panel.
2. Set the generator to 164 kHz with 30 % modulation at 400 Hz.
3. Tune to 164 kHz.
4. Adjust the core of ferrite bar antenna to maximize the output.
5. Set the frequency generator to 353 kHz.
6. Tune to 353 kHz.
7. Adjust C209 so that the output signal is maximized.
8. Repeat these adjustments (1 ~ 7) alternately until maximum selectivity is obtained.

8. Power Amplifier Idling Current Adjustment Procedure

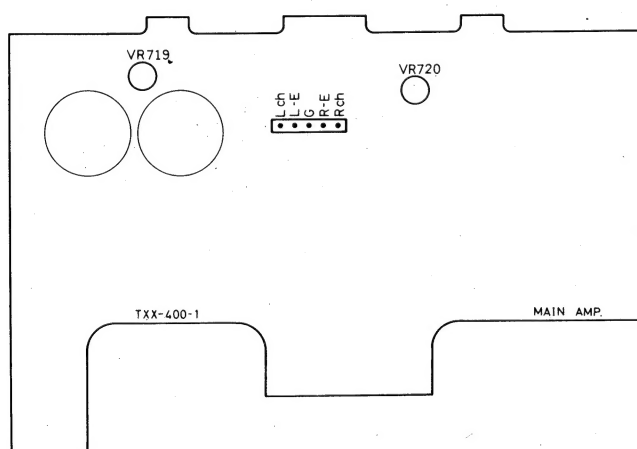


Fig. 8

Precaution:

- (1) Allow the set to warm up at least 5 minutes before connecting a DC VTVM.
- (2) Keep the heat-sink cooling to prevent overheating and consequent destruction of the semiconductor junction and set the volume control to minimum during these adjustment procedures.

(): for Right channel adjustment

Procedures:

1. Turn R719 (R720) fully counterclockwise before the power is switched on.
2. Connect a DC VTVM to test points Lch and L-E (Rch and R-E).
3. Adjust R719 (R720) to DC VTVM reading of 5 mV.

9. Printed Circuit Board Ass'y and Parts List

9-(1) TFC-39 Tuner P.C. Board Ass'y

TFC-39

A	B	C	D	E	F	G	H	I
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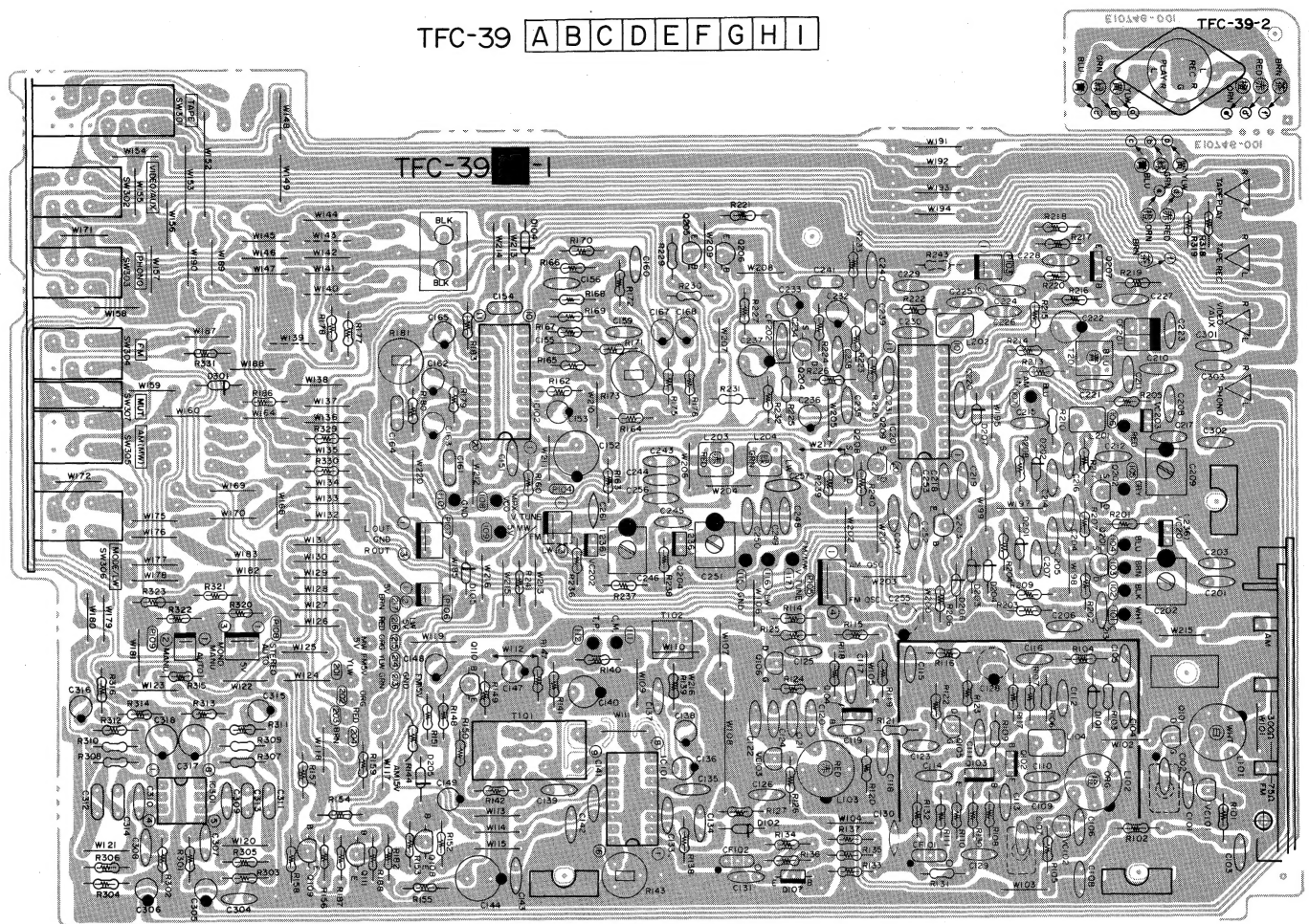


Fig. 9

Transistors

Item No.	Part Number	Rating	Description	Maker
Q101	2SK168(E,F)		F.E.T.	Hitachi
Q102	2SC535(B,C)		Silicon	"
Q103	2SC461(B,C)		"	"
Q104	2SC461(B,C)		"	"
Q105	2SK168(E,F)		F.E.T.	"
Q106	2SK168(E)		"	"
Q107	2SC535(B,C)		Silicon	"
Q108	2SC458(D)		"	"
Q109	2SC458(C,D)		"	"
Q110	2SC458(C,D)		"	"
Q111	2SC458(C,D)		"	"
Q201	2SK105(F,H)		F.E.T.	NEC
Q202	2SK105(F,H)		"	"
Q203	2SC458(C,D)		Silicon	Hitachi
Q204	2SK105(F,H)		F.E.T.	NEC
Q205	2SC458(C,D)		Silicon	Hitachi
Q206	2SC458(C,D)		"	"
Q207	2SC461(B,C)		"	"
Q208	2SK105(F,H)		F.E.T.	NEC
Q209	2SK105(F,H)		"	"

Integrated Circuits

Item No.	Part Number	Rating	Description	Maker
IC101	HA11225			Hi tachi
IC102	LA3390			Sanyo
IC201	LA1245			"
IC301	NJM4558D-D			Dainichi

Diodes

Item No.	Part Number	Rating	Description	Maker
D101	1S188FM		Silicon	Sanyo
D102	1S2076-31		"	Hitachi
D104	1S2076-31		"	"
D105	1S2076-31		"	"
D201	1S2076-31		"	"
D202	1S2076-31		"	"
D203	1S2076-31		"	"
D204	1S2076-31		"	"
D205	1S2076-31		"	"
D206	1S2076-31		"	"
D207	1S2076-31		"	"
D301	1S2076-31		"	"

Notes:

1. For items marked with "****", see "Specified Numbers for Designated Areas" following the parts list.
2. For items marked with "L", used for LW only.

Varicap Diodes

Item No.	Part Number	Rating	Description
			Maker
VC101	SVC202(AB)		Silicon Sanyo
VC102	SVC202(AB)		" "
VC103	SVC202(AB)		" "
VC201	KV1236Z		" Toko
VC202	KV1236Z		" "
VC203	KV1236Z		" "
VC204	KV1236Z		" "

Coils and Transformers

Item No.	Part Number	Rating	Description
* L101	EQR2306-014		RF Coil
* L101	EQR2306-016		"
L102	EQR2306-011		"
L103	EQR2406-002		"
L104	EQR3001-1R5KY		Inductor
L201	EQL3001-101KY		"
L202	EQL3001-102KY		"
L203	EQR1207-003		"
L204	EQR1307-002		"
T101	E03793-001		FM Det. Transformer
* T102	EQF0102-001		Filter
* T201	EQT1021-001		I.F. Transformer

Capacitors

Item No.	Part Number	Rating	Description
C102	QAT2001-001		Trimmer
C103	QCF21HP-103H	0.01 μ F 50 V	Ceramic
C104	QCF21HP-103H	" "	"
C105	QCF21HP-103H	" "	"
C106	QCS21HJ-5R0H	5 pF	"
C107	QCS21HJ-4R0H	4 pF	"
C108	QCF21HP-103H	0.01 μ F	"
C109	QCS21HJ-4R0H	4 pF	"
C110	QCS21HJ-100H	10 pF	"
C111	QCS21HJ-4R0H	4 pF	"
C112	QCS21HJ-151H	150 pF	"
C113	QCF21HP-103H	0.01 μ F	"
C114	QCF21HP-103H	"	"
C115	QCF21HP-103H	"	"
C116	QCF21HP-103H	"	"
C117	QCF21HP-103H	"	"
C118	QCT26UJ-100H	10 pF	"
C119	QCT26UJ-220H	22 pF	"
C120	QCS21HJ-7R0H	7 pF	"
C121	QCT26UJ-5R0H	5 pF	"
C122	QCT26UJ-5R0H	"	"
C123	QCS21HJ-4R0H	4 pF	"
C124	QCS21HJ-2R0H	2 pF	"
C125	QCF21HP-102H	1000 pF	"
C126	QCF21HP-223H	0.022 μ F	"
C129	QCF21HP-103H	0.01 μ F	"
C131	QCF21HP-223H	0.022 μ F	"
C133	QCF21HP-223H	"	"
C134	QCF21HP-223H	"	"
C135	QCS21HJ-151H	150 pF	"
C135	QCS21HJ-330H	33 pF	"
C136	QET61HM-105Z	1 μ F	Electro
C137	QCF21HP-223H	0.022 μ F	Ceramic
C138	QET61HM-106Z	10 μ F	Electro
C138	QET61HM-475Z	4.7 μ F	"

Capacitors

Item No.	Part Number	Rating	Description
C139	QCF21HP-223H	0.022 μ F 50 V	Ceramic
C140	QET61CM-476Z	47 μ F 16 V	Electro
C141	QCF21HP-223H	0.022 μ F 50 V	Ceramic
C142	QCF21HP-223H	" "	"
C143	QCF21HP-223H	" "	"
C144	QET51CM-227	220 μ F 16 V	Electro
C147	QET61EM-106Z	10 μ F 25 V	"
C148	QET61HM-475Z	4.7 μ F 50 V	"
C149	QET61HM-475Z	" "	"
C151	QCF21HP-223H	0.022 μ F	Ceramic
C152	QET51CM-227	220 μ F 16 V	Electro
C153	QET61HM-475Z	4.7 μ F 50 V	"
C154	QFM31HK-683	0.068 μ F	Mylar
C155	QCS21HJ-561H	560 pF	Ceramic
C155	QCY21HK-821H	820 pF	"
C156	QCS21HJ-561H	560 pF	"
C156	QCY21HK-821H	820 pF	"
C159	QCY21HK-103H	0.01 μ F	"
C160	QCY21HK-103H	"	"
C161	QFM31HK-473	0.047 μ F	Mylar
C162	QEB51EM-225	2.2 μ F 25 V	L.L.C.E
C163	QEB51EM-335	3.3 μ F	Electro
C164	QFP31HJ-102	1000 pF 50 V	Poly
C165	QEZ0046-105	1 μ F	Nonflam
C167	QET61HM-475Z	4.7 μ F	Electro
C168	QET61HM-475Z	"	"
C201	QCS21HJ-5R0H	5 pF	Ceramic
C202	QAT2001-005	"	Trimmer
C203	QCF21HP-223H	0.022 μ F	Ceramic
C204	QCF21HP-223H	"	"
C205	QCY21HK-102H	1000 pF	"
C206	QCF21HP-223H	0.022 μ F	"
C207	QCF21HP-223H	"	"
C208	QCS21HJ-470H	47 pF	"
C209	QAT2001-005	"	Trimmer
C210	QCF21HP-473H	0.047 μ F	"
C211	QCF21HP-223H	0.022 μ F	"
C212	QCY21HK-222H	2200 pF	"
C213	QCF21HP-223H	0.022 μ F	"
C214	QCF21HP-223H	"	"
C215	QCF21HP-223H	"	"
C216	QCS21HJ-181H	180 pF	"
C218	QCY21HK-102H	1000 pF	"
C219	QCF21HP-223H	0.022 μ F	"
C220	QCF21HP-223H	"	"
C221	QCF21HP-223H	"	"
C222	QET61CM-226Z	22 μ F 16 V	Electro
C223	QCS21HJ-560H	56 pF 50 V	Ceramic
C224	QCF21HP-223H	0.022 μ F	"
C225	QCS21HJ-121H	120 pF	"
C226	QCF21HP-223H	0.022 μ F	"
C227	QCF21HP-223H	"	"
C228	QCF21HP-223H	"	"
C229	QCF21HP-223H	"	"
C230	QCY21HK-102H	1000 pF	"
C231	QCF21HP-223H	0.022 μ F	"
C232	QET51HM-105	1 μ F	Electro
C233	QET51HM-475	4.7 μ F	"
C234	QCF21HP-223H	0.022 μ F	Ceramic
C235	QCF21HP-223H	"	"
C236	QET61HM-105Z	1 μ F	Electro
C237	QET61CM-476Z	47 μ F 16 V	"
C238	QCF21HP-223H	0.022 μ F 50 V	Ceramic
C239	QFM31HK-473	0.047 μ F	Mylar
C240	QCY21HK-472H	4700 pF	Ceramic
C241	QFM31HK-473	0.047 μ F	Mylar
C243	QCS21HJ-221H	220 pF	Ceramic
C244	QCS21HJ-221H	"	"
C245	QCS21HJ-180H	18 pF	"
C246	QAT2001-005	"	Trimmer

Capacitors

Item No.	Part Number	Rating		Description
L C247	QCF21HP-223H	0.022 μ F	50 V	Ceramic
L C248	QCS21HJ-101H	100 pF	"	"
L C249	QCS21HJ-820H	82 pF	"	"
L C250	QCS21HJ-820H	"	"	"
L C251	QAT2001-005			Trimmer
	C252	QCY21HK-103	0.01 μ F	50 V
	C253	QCF21HP-223H	0.022 μ F	"
	C256	QCS21HJ-820H	82 pF	"
	C301	QCF21HP-223H	0.022 μ F	"
	C302	QCF21HP-223H	"	"
	C303	QCF21HP-223H	"	"
	C304	QCF21HP-223H	"	"
	C305	QET61HM-475Z	4.7 μ F	Electro
	C306	QET61HM-475Z	"	"
	C307	QCS21HJ-331H	330 pF	Ceramic
	C308	QCS21HJ-331H	"	"
	C309	QCS21HJ-560H	56 pF	"
	C310	QCS21HJ-560H	"	"
	C311	QFM31HK-182	1800 pF	Mylar
	C312	QFM31HK-182	"	"
	C313	QFM31HK-682	6800 pF	"
	C314	QFM31HK-682	"	"
	C315	QET61HM-105Z	1 μ F	Electro
	C316	QET61HM-105Z	"	"
	C317	QET61CM-476Z	47 μ F	16 V
L C318	QET61CM-476Z	"	"	"

Resistors

Item No.	Part Number	Rating		Description
* R225	QRD148J-221S	220	1/4 W	Carbon
* R229	QRD148J-562S	5.6 k	"	"
* R229	QRD148J-223S	22 k	"	"
* R230	QRD148J-103S	10 k	"	"
* R230	QRD148J-182S	1.8 k	"	"
L R231	QRD148J-223S	22 k	"	"
R232	QRD149J-101S	100	"	U. Carbon Δ
R241	QRD148J-103S	10 k	"	Carbon
L R243	QRD141J-155S	1.5 M	"	"
R307	QRD148J-393S	39 k	"	"
R308	QRD148J-393S	"	"	"
R309	QRD148J-474S	470 k	"	"
R310	QRD148J-474S	"	"	"
R311	QRD141J-101S	100	"	"
R312	QRD141J-101S	"	"	"
R315	QRD141J-181S	180	"	"
R316	QRD141J-181S	"	"	"
* R318	QRD148J-124S	120 k	"	"
* R319	QRD148J-124S	"	"	"
R327	QRD148J-332S	3.3 k	"	"
R328	QRD148J-332S	"	"	"

Δ : Safety Parts

Resistors

Item No.	Part Number	Rating		Description
* R103	QRD148J-270S	27	1/4 W	Carbon
* R106	QRD148J-302S	3 k	"	"
* R106	QRD148J-472S	4.7 k	"	"
R114	QRD149J-101S	100	"	U. Carbon Δ
R115	QRD148J-102S	1 k	"	Carbon
R116	QRD149J-470S	47	"	U. Carbon Δ
R117	QRD149J-101S	100	"	" Δ
R120	QRD148J-682S	6.8 k	"	Carbon
R125	QRD148J-331S	330	"	"
R131	QRD148J-222S	2.2 k	"	"
R140	QRD141J-561S	560	"	"
R141	QRD148J-243S	24 k	"	"
R142	QRD148J-332S	3.3 k	"	"
R143	EVP314-7-B24			Variable
R144	QRD149J-101S	100	1/4 W	U. Carbon Δ
* R147	QRD148J-103S	10 k	"	Carbon
* R148	QRD148J-334S	330 k	"	"
* R149	QRD148J-823S	82 k	"	"
* R150	QRD148J-222S	2.2 k	"	"
* R151	QRD148J-472S	4.7 k	"	"
R153	QRD148J-473S	47 k	"	"
R154	QRD141J-561S	560	"	"
R160	QRD149J-101S	100	"	U. Carbon Δ
R165	QRD148J-913S	91 k	"	Carbon
R166	QRD148J-913S	"	"	"
R173	EVP314-7-B54			Variable
R180	QRD148J-123S	12 k	1/4 W	Carbon
R181	EVP314-7-B14			Variable
R183	QRD148J-122S	1.2 k	1/4 W	Carbon
R189	QRD148J-153S	150 k	"	"
L R211	QRD148J-102S	1 k	"	"
L R215	QRD148J-562S	5.6 k	"	"
L R219	QRD148J-102S	1 k	"	"
L R220	QRD148J-562S	5.6 k	"	"
* R225	QRD148J-820S	82	"	"

Others

Item No.	Part Number	Rating	Description
E10746-001			Circuit Board
* SW301	QST1651-E01		Push Switch
* SW301	QST1651-E02		"
	EMN00T-V-402A		Pin Jack Ass'y
	E65396-001		Earth Plate
	E69328-001		Shield Cover
P101	QMV5005-007		7P Plug Ass'y
P102	QMV5005-007		"
L P103	QMV5005-002		2P Plug Ass'y (for LW only)
P104	QMV5005-003		3P Plug Ass'y
P105	QMV5005-004		4P Plug Ass'y
P106	QMV5005-002		2P Plug Ass'y
P107	QMV5005-003		3P Plug Ass'y
L P108	QMV5005-003		"
P109	QMV5005-002		2P Plug Ass'y
* CF101	ECB2118-001R		Ceramic Filter
* CF101	ECB2123-002R		"
* CF102	ECB2118-001R		"
* CF102	ECB2123-002R		"
CF201	ECB1545-001		"
* CF202	E03613-022		"
LF101	EQF0101-002		Filter
LF102	EQF0101-002		"

Notes:

- For items marked with "****", see "Specified Numbers for Designated Areas" following the parts list.
- For items marked with "L", used for LW only.

Specified Numbers for Designated Areas

Item No.	U.S.A. and Canada	Europe and Australia	West Germany	U.S. Military Market and Other Countries	Europe (with LW)	U.K. (with LW)
SW301 Q110 CF101 CF102 CF202	QST1651-E02 — ECB2123-002R ECB2123-002R E03613-002	QST1651-E02 — ECB2118-001R ECB2118-001R E03613-022	QST1651-E02 2SC458 (C, D) ECB2118-001R ECB2118-001R E03613-022	QST1651-E02 — ECB2123-002R ECB2123-002R E03613-022	QST1651-E01 — ECB2118-001R ECB2118-001R —	QST1651-E01 — ECB2118-001R ECB2118-001R —
L101 T102 C110 C135 C138	EQR-2306-014 — — QCS21HJ-151H QET61HM-475Z	EQR2306-014 — — QCS21HJ-151H QET61HM-475Z	EQR2306-016 EQF0102-001 QCS21HJ-100H QCS21HJ-330H QET61HM-106Z	EQR2306-014 — — QCS21HJ-151H QET61HM-475Z	EQR2306-014 — — QCS21HJ-151H QET61HM-475Z	EQR2306-014 — — QCS21HJ-151H QET61HM-475Z
C147 C148 C155 C156 C304	— — QCT21HK-821H QCY21HK-821H —	— — QCS21HJ-561H QCS21HJ-561H —	QET61EM-106Z QET61HM-475Z QCS21HJ-561H QCS21HJ-561H QCF21HP-223H	— — QCY21HK-821H QCY21HK-821H —	— — QCS21HJ-561H QCS21HJ-561H —	— — QCS21HJ-561H QCS21HJ-561H —
C307 C308 R106 R147 R148	— — QRD148J-472S — —	— — QRD148J-472S — —	QCS21HJ-331H QCS21HJ-331H QRD148J-302S QRD148J-103S QRD148J-334S	— — QRD148J-472S — —	— — QRD148J-472S — —	— — QRD148J-472S — —
R149 R150 R151 R225 R229	— — — QRD148J-820S QRD148J-562S	— — — QRD148J-820S QRD148J-562S	QRD148J-823S QRD148J-222S QRD148J-472S QRD148J-820S QRD148J-562S	— — — QRD148J-820S QRD148J-562S	— — — QRD148J-221S QRD148J-223S	— — — QRD148J-221S QRD148J-223S
R230 R318 R319	QRD148J-182S — —	QRD148J-182S QRD148J-124S QRD148J-124S	QRD148J-182S QRD148J-124S QRD148J-124S	QRD148J-182S — —	QRD148J-103S QRD148J-124S QRD148J-124S	QRD148J-103S QRD148J-124S QRD148J-124S

9-(2) TDC-64 Logic P.C. Board Ass'y

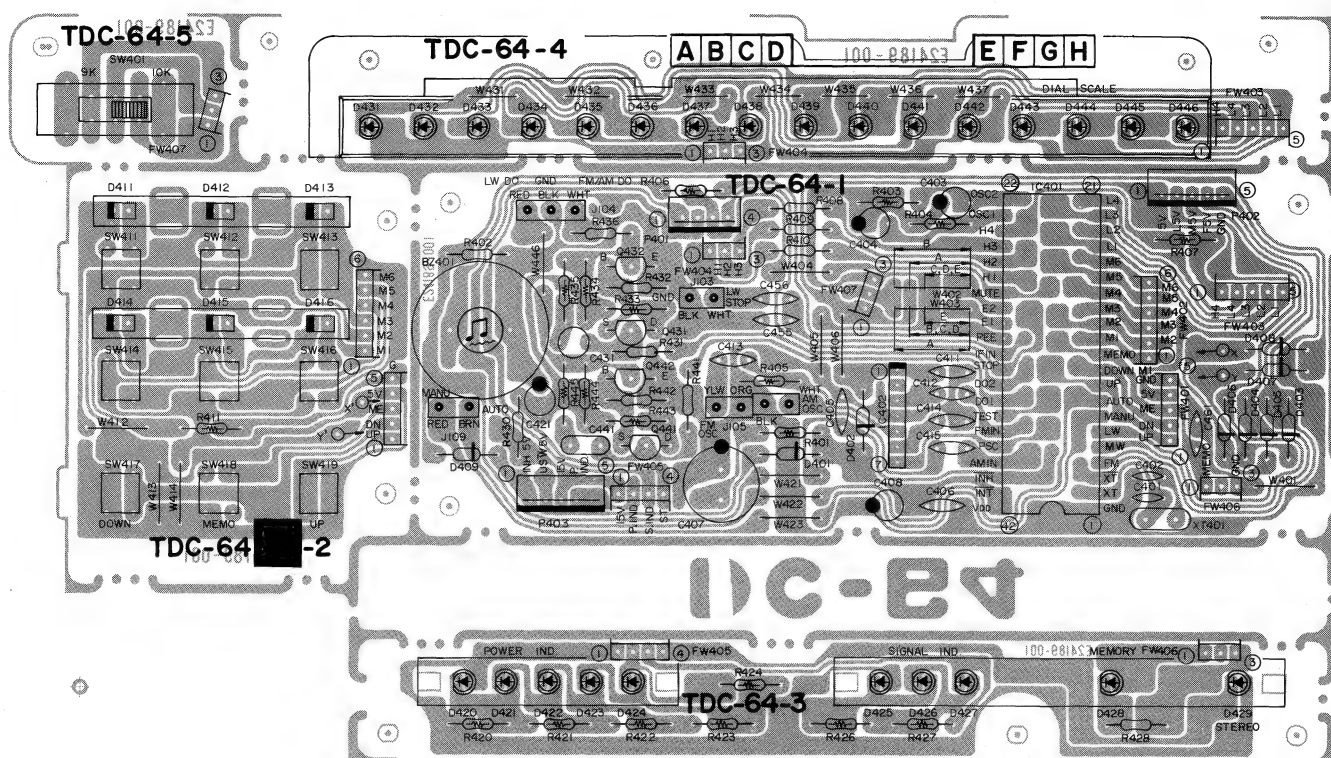


Fig. 10

Transistors

Item No.	Part Number	Rating	Description	Maker
Q431	2SK105(E)		F.E.T.	NEC
Q432	2SC458(D)		Silicon	Hitachi
Q441	2SK105(E)		F.E.T.	NEC
Q442	2SC458(D)		Silicon	Hitachi

Integrated Circuits

Item No.	Part Number	Rating	Description	Maker
IC401	TC9146AP			Toshiba
IC402	TD6104P			Toshiba

Diodes

Item No.	Part Number	Rating	Description	Maker
D401	1S2076-31		Silicon	Hitachi
D402	1S2076-31		"	"
D403	1S2076-31		"	"
D404	1S2076-31		"	"
D406	1S2076-31		"	"
D407	1S2076-31		"	"
D408	1S2076-31		"	"
D409	1S2076-31		"	"
D411	TLR208		L.E.D.	Toshiba
D412	TLR208		"	"
D413	TLR208		"	"
D414	TLR208		"	"
D415	TLR208		"	"
D416	TLR208		"	"
D420	TLR143		"	"

Diodes

Item No.	Part Number	Rating	Description	Maker
D421	TLR143		L.E.D.	Toshiba
D422	TLR143		"	"
D423	TLR143		"	"
D424	TLR143		"	"
D425	TLO143		"	"
D426	TLO143		"	"
D427	TLO143		"	"
D428	TLG143		"	"
D429	TLR143		"	"
D431	TLR143		"	"
D432	TLR143		"	"
D433	TLR143		"	"
D434	TLR143		"	"
D435	TLR143		"	"
D436	TLR143		"	"
D437	TLR143		"	"
D438	TLR143		"	"
D439	TLR143		"	"
D440	TLR143		"	"
D441	TLR143		"	"
D442	TLR143		"	"
D443	TLR143		"	"
D444	TLR143		"	"
D445	TLR143		"	"
D446	TLR143		"	"

Note:

For items marked with "L", used for LW only.

Capacitors

Item No.	Part Number	Rating		Description
C401	QCS21HJ-8ROH	8 pF	50 V	Ceramic
C402	QCS21HJ-100H	10 pF	"	"
C403	QET51HM-105	1 μ F	"	Electro
C404	QET51HM-105	"	"	"
C405	QCF21HP-103H	0.01 μ F	"	Ceramic
C406	QCF21HP-223H	0.022 μ F	"	"
C407	QET50JM-228	2200 μ F	6.3 V	Electro
C408	QET51AM-107	100 μ F	10 V	"
C411	QCF21HP-103H	0.01 μ F	50 V	Ceramic
C412	QCF21HP-103H	"	"	"
C413	QCS21HJ-221H	220 pF	"	"
C414	QCF21HP-103H	0.01 μ F	"	"
C415	QCF21HP-103H	"	"	"
C421	QET51CM-476	47 μ F	16 V	Electro
C431	QE Z0046-225	2.2 μ F	50 V	Nonflam
L * * C441	QFM31HK-473	0.047 μ F	"	Mylar
C455	QCF21HP-103H	0.01 μ F	"	Ceramic
C456	QCF21HP-103H	"	"	"
C461	QCF21HP-102H	1000 pF	"	"

Resistors

Item No.	Part Number	Rating		Description
R401	QRD148J-102S	1 k	1/4 W	Carbon
R402	QRD148J-561S	560	"	"
R403	QRD148J-683S	68 k	"	"
R404	QRD148J-683S	"	"	"
R405	QRD148J-823S	82 k	"	"
R406	QRD148J-103S	10 k	"	"
R407	QRD148J-221S	220	"	"
R408	QRD148J-221S	"	"	"
R409	QRD148J-221S	"	"	"
R410	QRD148J-221S	"	"	"
R411	QRD148J-271S	270	"	"
R420	QRD148J-222S	2.2 k	"	"
R421	QRD148J-561S	560	"	"
R422	QRD148J-331S	330	"	"
R423	QRD148J-181S	180	"	"
R424	QRD148J-121S	120	"	"
R426	QRD148J-681S	680	"	"
R427	QRD148J-331S	330	"	"
R428	QRD148J-221S	220	"	"
R431	QRD148J-102S	1 k	"	"

Resistors

Item No.	Part Number	Rating		Description
R432	QRD148J-331S	330	1/4 W	Carbon
R433	QRD148J-222S	2.2 k	"	"
R434	QRD148J-103S	10 k	"	"
R435	QRD148J-152S	1.5 k	"	"
R436	QRD148J-222S	2.2 k	"	"
L L L L L R441	QRD148J-122S	1.2 k	"	"
R442	QRD148J-331S	330	"	"
R443	QRD148J-222S	2.2 k	"	"
R444	QRD148J-103S	10 k	"	"
R445	QRD148J-563S	56 k	"	"

Others

Item No.	Part Number	Rating	Description
P401	E24189-001		Circuit Board
	E69330-001		LED Holder
	E69331-001		"
	E69413-001		"
	QMV5005-004		4P Plug Ass'y
P402	QMV5005-005		5P Plug Ass'y
P403	QMV5005-004		4P Plug Ass'y
BZ401	ENZ7001-001		Ceramic Buzzer
SW411	ESP0001-007		Push Switch
SW412	ESP0001-007		"
SW413	ESP0001-007		"
SW414	ESP0001-007		"
SW415	ESP0001-007		"
SW416	ESP0001-007		"
SW417	ESP0001-007		"
SW418	ESP0001-007		"
SW419	ESP0001-007		"
XT401	ECX0007-200KA		Resonator

Notes:

- For items marked with "***", see "Specified Numbers for Designated Areas" following the parts list.
- For items marked with "L", used for LW only.

Specified Numbers for Designated Areas

Item No.	U.S.A. and Canada	Europe and Australia	West Germany	U.S. Military Market and Other Countries	Europe (with LW)	U.K. (with LW)
Q441	—	—	—	—	2SK105(E)	2SK105(E)
Q442	—	—	—	—	2SC458(D)	2SC458(D)
D406	—	—	—	—	1S2076-31	1S2076-31
D408	—	—	—	—	1S2076-31	1S2076-31
C441	—	—	—	—	QFM31HK-473	QFM31HK-473
C455	QCF21HP-103H	QCF21HP-103H	QCF21HP-103H	QCF21HP-103H	—	—
C456	—	—	—	—	QCF21HP-103H	QCF21HP-103H
R441	—	—	—	—	QRD148J-122S	QRD148J-122S
R442	—	—	—	—	QRD148J-331S	QRD148J-331S
R443	—	—	—	—	QRD148J-222S	QRD148J-222S
R444	—	—	—	—	QRD148J-103S	QRD148J-103S
R445	—	—	—	—	QRD148J-563S	QRD148J-563S

9-(3) TXX-400 Amplifier P.C. Board Ass'y

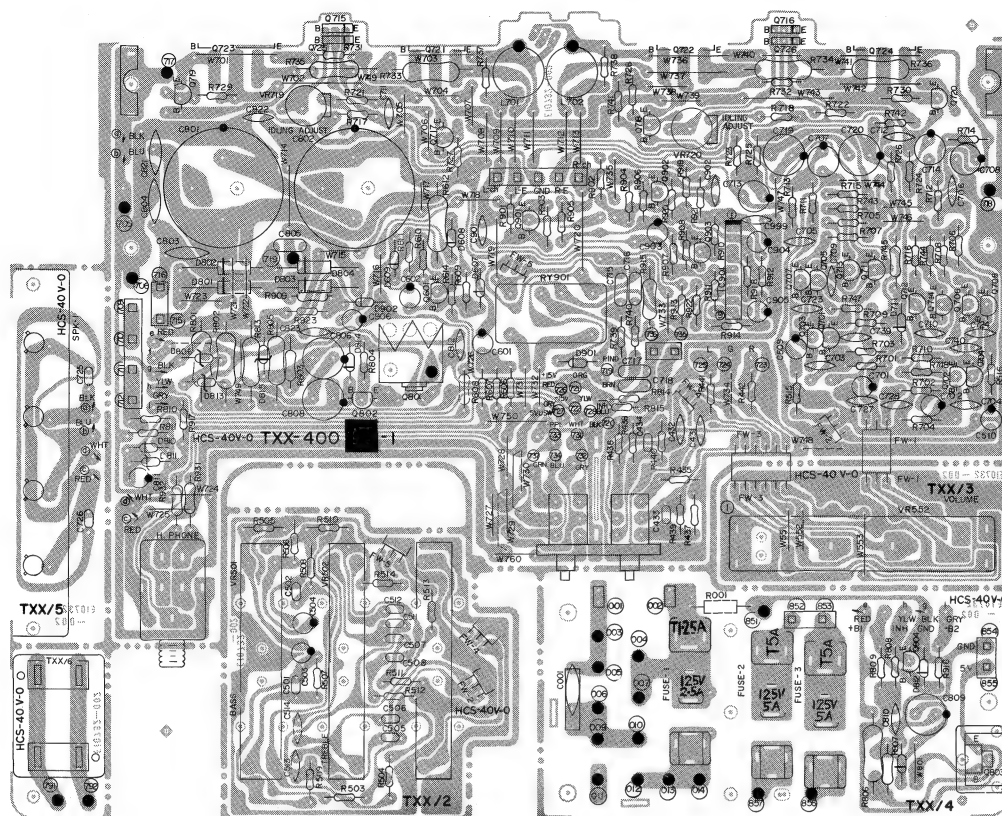


Fig. 11

Transistors

Item No.	Part Number	Rating	Description
Q701	2SC1775AV(F)		Silicon Hitachi
Q702	2SC1775AV(F)		" "
Q703	2SC1775AV(F)		" "
Q704	2SC1775AV(F)		" "
Q705	2SA872AV(E)		" "
Q706	2SA872AV(E)		" "
Q707	2SA872AV(E)		" "
Q708	2SA872AV(E)		" "
Q711	2SA872AV(E)		" "
Q712	2SA872AV(E)		" "
Q713	2SA949(O,Y)		" Toshiba
Q714	2SA949(O,Y)		" "
Q715	2SD636(Q,R)		" Matsushita
Q716	2SD636(Q,R)		" "
Q717	2SC2235(O,Y)		" Toshiba
Q718	2SC2235(O,Y)		" "
Q719	2SA965(O,Y)		" "
Q720	2SA965(O,Y)		" "
Q721	2SD716LB(O,R)		" "
Q722	2SD716LB(O,R)		" "
Q723	2SB686LB(O,R)		" "
Q724	2SB686LB(O,R)		" "
Q725	2SD636(Q,R)		" Matsushita
Q726	2SD636(Q,R)		" "
Q801	2SD313V(D,E)		" Sanyo
Q802	2SC945A(P,Q)		" NEC
Q803	2SD313V(D,E)		" Sanyo
Q804	2SC945A(P,Q)		" NEC
Q901	2SC1775AV(F)		" Hitachi
Q902	2SC1775AV(F)		" "
Q903	2SA733A(P,Q)		" NEC
X601	2SC458(D)		" Hitachi

Note:

For items marked with "*", see "Specified Numbers for Designated Areas" following the parts list.

Integrated Circuit

Item No.	Part Number	Rating	Description
IC901	TA7317P		Maker Toshiba

Diodes

Item No.	Part Number	Rating	Description
D607	1S2076-31		Silicon Hitachi
D608	1S2076-31		" "
D609	1S2076-31		" "
D701	RD13EB3		" NEC
D801	S3V20F		" Shindengen
D802	S3V20F		" "
D803	S3V20F		" "
D804	S3V20F		" "
D805	RD15EB3		" NEC
D806	RD6.2EB3		" "
D807	RD6.2EB3		" "
D810	1S2076-31		" Hitachi
D811	RD5.1EB2		" NEC
D812	1S2076-31		" Hitachi
D813	RD6.2EB3		" NEC
D901	1S2076-31		" Hitachi
D902	1S2076-31		" "

Coils

Item No.	Part Number	Rating	Description
L701	E04059-1R2M		Choke Coil
L702	E04059-1R2M		"

Capacitors

Item No.	Part Number	Rating		Description
C431	QCS31HJ-181Z	180 pF	50 V	Ceramic
C432	QCS31HJ-181Z	"	"	"
C433	QFM31HK-183Z	0.018 μ F	"	Mylar
C434	QFM31HK-183Z	"	"	"
C501	QFM31HK-333Z	0.033 μ F	"	"
C502	QFM31HK-333Z	"	"	"
C503	QE Z0046-224	0.22 μ F	"	Nonflam
C504	QE Z0046-224	"	"	"
C505	QFM31HK-222Z	2200 pF	"	Mylar
C506	QFM31HK-222Z	"	"	"
C507	QFM31HK-223Z	0.022 μ F	"	"
C508	QFM31HK-223Z	"	"	"
C509	QET61HM-475ZM	4.7 μ F	"	Electoro
C510	QET61HM-475ZM	"	"	"
C511	QFM31HK-332Z	3300 pF	"	Mylar
C512	QFM31HK-332Z	"	"	"
C513	QCS31HJ-331Z	330 pF	"	Ceramic
C514	QCS31HJ-331Z	"	"	"
C602	QET61HM-475Z	4.7 μ F	"	Electoro
C701	QET61HM-225	2.2 μ F	"	"
C702	QET61HM-225	"	"	"
C703	QCS31HJ-101Z	100 pF	"	Ceramic
C704	QCS31HJ-101Z	"	"	"
C705	QCS31HJ-220Z	22 pF	"	"
C706	QCS31HJ-220Z	"	"	"
C707	QET61AM-107Z	100 μ F	10 V	Electoro
C708	QET61AM-107Z	"	"	"
C709	QCS31HJ-390Z	39 pF	50 V	Ceramic
C710	QCS31HJ-390Z	"	"	"
C711	QCY21HK-103	0.01	"	"
C712	QCY21HK-103	"	"	"
C713	QET61HM-226Z	22 μ F	"	Electro
C714	QET61HM-226Z	"	"	"
C715	QFM31HK-473Z	0.047 μ F	"	Mylar
C716	QFM31HK-473Z	"	"	"
C717	QFM31HK-473Z	"	"	"
C718	QFM31HK-473Z	"	"	"
C719	QET51HM-107	100 μ F	"	Electoro
C720	QET51HM-107	"	"	"
C723	QCS31HJ-330Z	33 pF	"	Ceramic
C724	QCS31HJ-330Z	"	"	"
C725	QFM31HK-102Z	1000 pF	"	Mylar
C726	QFM31HK-102Z	"	"	"
C739	QCS31HJ-181Z	180 pF	"	Ceramic
C740	QCS31HJ-181Z	"	"	"
C801	QEW81HA-688	6800 μ F	"	Electro
C802	QEW81HA-688	"	"	"
C803	QCE22HP-103H	0.01 μ F	"	Ceramic
C804	QCE22HP-103H	"	"	"
C805	QFM32AK-104Z	0.1 μ F	100 V	Mylar
C806	QET51CM-227	220 μ F	16 V	Electoro
C808	QET51CM-107	100 μ F	"	"
C809	QET51AM-227	220 μ F	10 V	"
C810	QCF31HP-103Z	0.01 μ F	50 V	Ceramic
C811	QET61AM-476Z	47 μ F	10 V	Electro
C812	QCF31HP-103Z	0.01 μ F	50 V	Ceramic
C821	QCF21HP-473H	0.047 μ F	"	"
C822	QCF21HP-473H	"	"	"
C901	QCF31HP-223Z	0.022 μ F	"	"
C902	QCF31HP-223Z	"	"	"
C903	QET61HM-226ZM	22 μ F	"	Electro
C904	QET61AM-107ZM	100 μ F	10 V	"
C905	QET61CM-226ZM	22 μ F	16 V	"
C906	QET61HM-105ZM	1 μ F	50 V	"
C999	QCF31HP-102Z	1000 pF	"	Ceramic

Resistors

Item No.	Part Number	Rating		Description
* R001	QRC121K-275EM	2.7 M	1/2 W	Composi Δ
R435	QRD141J-564S	560 k	1/4 W	Carbon
R436	QRD141J-564S	"	"	"
R437	QRD141J-223S	22 k	"	"
R438	QRD141J-223S	"	"	"
R439	QRD141J-683S	68 k	"	"
R440	QRD141J-683S	"	"	"
R441	QRD141J-332S	3.3 k	"	"
R442	QRD141J-332S	"	"	"
R503	QRD141J-123S	12 k	"	"
R504	QRD141J-123S	"	"	"
R505	QRD141J-182S	1.8 k	"	"
R506	QRD141J-182S	"	"	"
R507	QRD141J-823S	82 k	"	"
R508	QRD141J-823S	"	"	"
R509	QRD141J-182S	1.8 k	"	"
R510	QRD141J-182S	"	"	"
R511	QRD141J-561S	560	"	"
R512	QRD141J-561S	"	"	"
R513	QRD141J-472S	4.7 k	"	"
R514	QRD141J-472S	"	"	"
R515	QRD141J-562S	5.6 k	"	"
R516	QRD141J-562S	"	"	"
R606	QRD141J-222S	2.2 k	"	"
R607	QRD141J-222S	"	"	"
R609	QRD141J-390S	39	"	"
R611	QRD141J-560S	56	"	"
R612	QRD029J-122	1.2 k	2 W	O.M.Film Δ
R614	QRD141J-181S	180	1/4 W	Carbon
R701	QRD141J-222S	2.2 k	"	"
R702	QRD141J-222S	"	"	"
R703	QRD141J-104S	100 k	"	"
R704	QRD141J-104S	"	"	"
R705	QRD149J-101S	100	"	U. Carbon Δ
R708	QRD149J-101S	"	"	Δ
R709	QRD141J-822S	8.2 k	"	Carbon
R710	QRD141J-822S	"	"	"
R711	QRD141J-561S	560	"	"
R712	QRD141J-561S	"	"	"
R713	QRD141J-683S	68 k	"	"
R714	QRD141J-683S	"	"	"
R715	QRD141J-272S	2.7 k	"	"
R716	QRD141J-272S	"	"	"
R717	QRD141J-332S	3.3 k	"	"
R718	QRD141J-332S	"	"	"
R721	QRD141J-152S	1.5 k	"	"
R722	QRD141J-152S	"	"	"
R723	QRD141J-472S	4.7 k	"	"
R724	QRD141J-472S	"	"	"
R725	QRD141J-182S	1.8 k	"	"
R726	QRD141J-182S	"	"	"
* R727	QRD149J-100S	10	"	U. Carbon Δ
* R727	QRZ0052-100	"	"	Fusible Δ
* R728	QRD149J-100S	"	"	U. Carbon Δ
* R728	QRZ0052-100	"	"	Fusible Δ
R729	QRD149J-100S	"	"	U. Carbon Δ
R729	QRZ0052-100	"	"	Fusible Δ
R730	QRD149J-100S	"	"	U. Carbon Δ
R730	QRZ0052-100	"	"	Fusible Δ
R731	QRD149J-271S	270	"	U. Carbon Δ
R732	QRD149J-271S	"	"	Δ
R733	QRX029J-R22S	0.22	2 W	O.M.Film Δ
R734	QRX029J-R22S	"	"	Δ
R735	QRX029J-R22S	"	"	Δ
R736	QRX029J-R22S	"	"	Δ
R737	QRD149J-4R7S	4.7	1/4 W	U. Carbon Δ
R738	QRD149J-4R7S	"	"	Δ
R739	QRD141J-100S	10	"	Carbon
R740	QRD141J-100S	"	"	"
R741	QRD149J-470S	47	"	U. Carbon Δ

Resistors

Item No.	Part Number	Rating		Description
R742	QRD149J-470S	47	1/4 W	U. Carbon △
R743	QRD149J-330S	33	"	" △
R744	QRD149J-330S	"	"	" △
R745	QRD129J-182	1.8 k	1/2 W	" △
* R801	QRG026J-121	120	2 W	O.M.Film △
* R801	QRG029J-121	"	"	" △
* R802	QRG026J-121	"	"	" △
* R802	QRG029J-121	"	"	" △
R803	QRD129J-182	1.8 k	1/2 W	U. Carbon △
R804	QRD149J-101S	100	1/4 W	" △
* R806	QRG026J-101	"	2 W	O.M. Film △
* R806	QRG029J-101	"	"	" △
R807	QRD129J-222	2.2 k	1/2 W	U. Carbon △
R808	QRD141J-222S	"	1/4 W	Carbon
R809	QRD141J-563S	56 k	"	"
R810	QRD141J-332S	3.3 k	"	"
R811	QRD141J-472S	4.7 k	"	"
* R813	QRG026J-121	120	2 W	O.M. Film △
* R813	QRG029J-121	"	"	" △
R814	QRD129J-330	33	1/2 W	U. Carbon △
R901	QRD141J-222S	2.2 k	1/4 W	Carbon
R902	QRD141J-222S	"	"	"
R903	QRD141J-102S	1 k	"	"
R904	QRD141J-102S	"	"	"
R905	QRD141J-123S	12 k	"	"
R906	QRD141J-123S	"	"	"
R907	QRD141J-103S	10 k	"	"
R908	QRD141J-332S	3.3 k	"	"
R909	QRD141J-222S	2.2 k	"	"
R910	QRD141J-563S	56 k	"	"
R911	QRD141J-183S	18 k	"	"
R912	QRD141J-683S	68 k	"	"
R913	QRD141J-123S	12 k	"	"
R914	QRD141J-184S	180 k	"	"
R915	QRG017J-471S	470	1 W	O.M.Film △
R916	QRD141J-273S	27 k	1/4 W	Carbon
R917	QRD141J-223S	22 k	"	"
R918	QRD141J-104S	100 k	"	"
R919	QRD141J-104S	"	"	"
R920	QRD141J-104S	"	"	"

△ : Safety Parts

Resistors

Item No.	Part Number	Rating		Description
R921	QRD141J-563S	56 k	"	"
R922	QRD141J-151S	150	"	"
R923	QRD141J-472S	4.7 k	"	"
R931	QRD129J-221	220	1/2 W	U. Carbon △
R932	QRD129J-221	"	"	" △
VR501	QVZ5010-102			Slide Variable
VR502	QVZ5010-102			"
VR551	QVZ5010-104			"
VR552	QVZ5010-008			"
VR719	EVP314-7-B13			Variable
VR720	EVP314-7-B13			"

Others

Item No.	Part Number	Rating	Description
	E10732-001		Circuit Board
	QST8242-E01		Push switch
* E45524-002			Fuse Clip
* EMG7331-001			"
	E65119-001		Special Screen
	SBSB3008Z		Tapping Screw
	SBSB3010Z		"
	E60171-003		Heat Sink
	E61537-005		"
	E302215-002		Heat Sink Bracket(L)
	E302215-001		Heat Sink
	SBSE3012Z		Screw
RY901	E302215-001		Heat Sink Bracket(R)
	ESK6D24-213		Relay

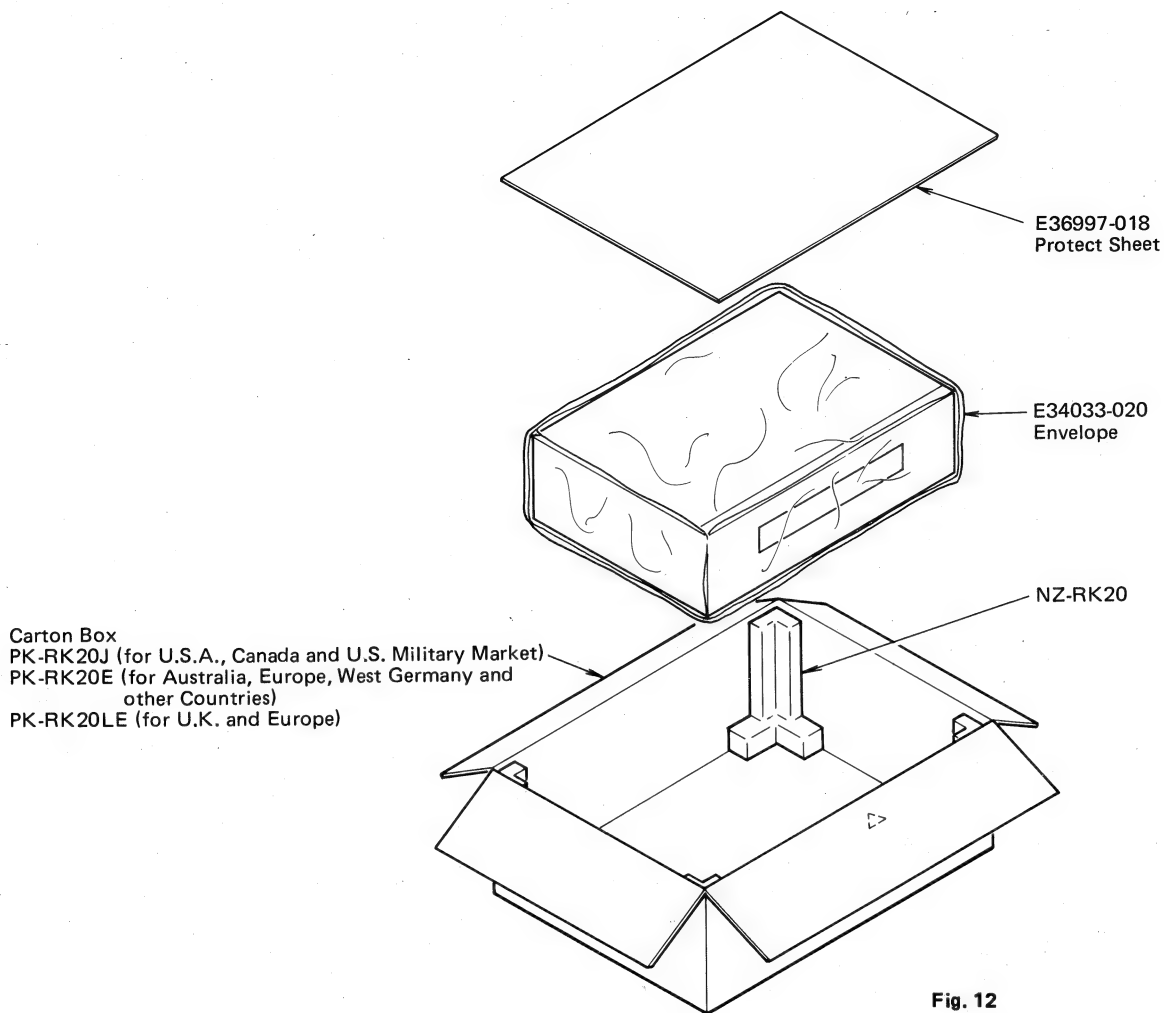
Note:

For items marked with "***", "Specified Numbers for Designated Areas" following the parts list.

Specified Numbers for Designated Areas

Item No.	U.S.A. and Canada	Europe and Australia	West Germany	U.S. Military Market and Other Countries	Europe (with LW)	U.K. (with LW)
Q725	—	2SD636 (Q, R)	2SD636 (Q, R)	—	2SD636 (Q, R)	2SD636 (Q, R)
Q726	—	2SD636 (Q, R)	2SD636 (Q, R)	—	2SD636 (Q, R)	2SD636 (Q, R)
R001	QRC121K-275EM	—	—	—	—	—
R727	QRD149J-271S	QRZ0052-100	QRZ0052-100	QRD149J-271S	QRZ0052-100	QRZ0052-100
R728	QRD149J-271S	QRZ0052-100	QRZ0052-100	QRD149J-271S	QRZ0052-100	QRZ0052-100
R729	QRD149J-271S	QRZ0052-100	QRZ0052-100	QRD149J-271S	QRZ0052-100	QRZ0052-100
R730	QRD149J-271S	QRZ0052-100	QRZ0052-100	QRD149J-271S	QRZ0052-100	QRZ0052-100
R801	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG026J-121
R802	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG026J-121
R806	QRG029J-101	QRG029J-101	QRG029J-101	QRG029J-101	QRG029J-101	QRG026J-101
R813	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG029J-121	QRG026J-121
Fuse Clip	E45524-002	EMG7331-001	EMG7331-001	—	EMG7331-001	EMG7331-001

10. Packing Materials and Part Numbers

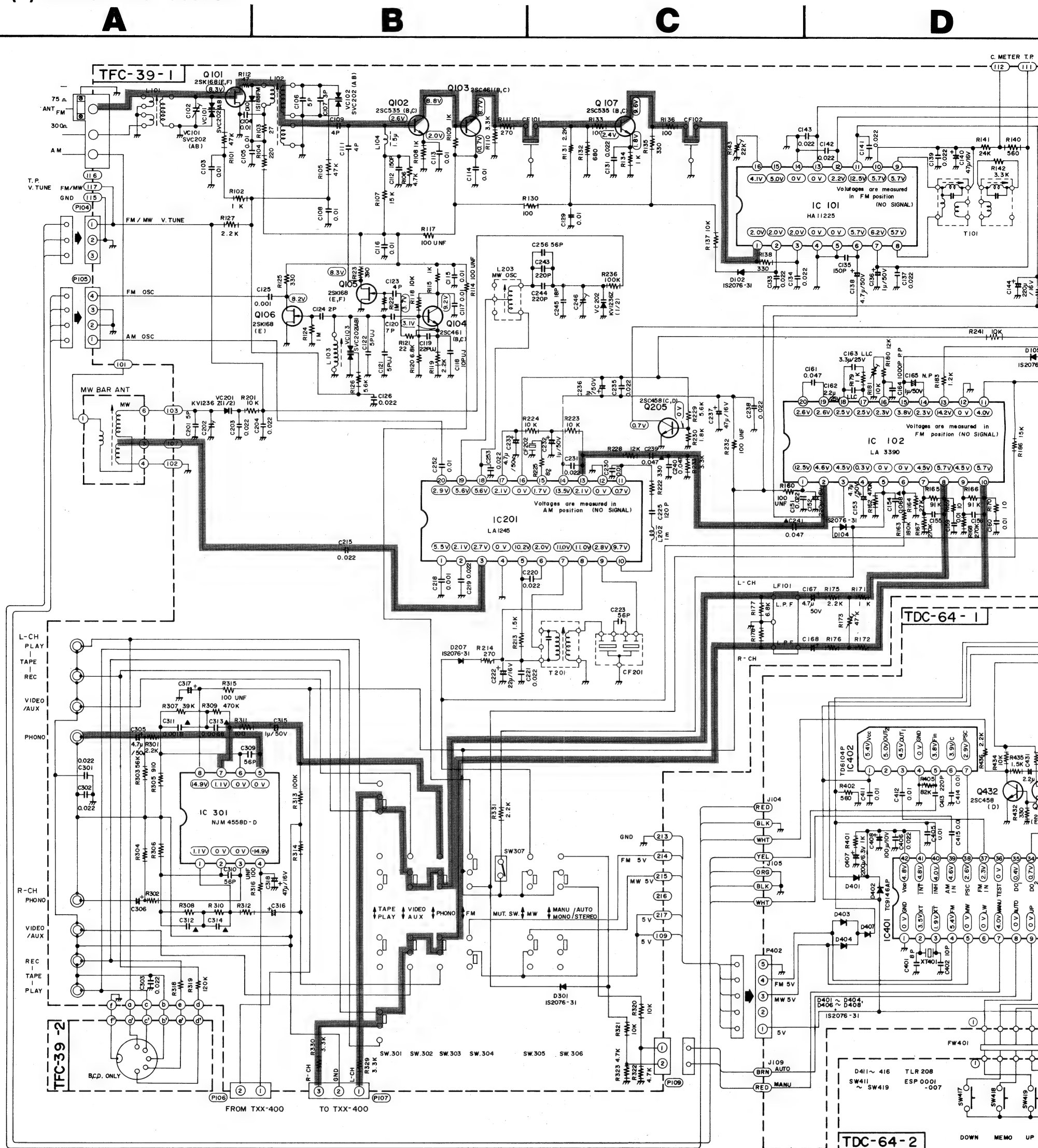


11. Accessories List

Item No.	Part Number	Description	Q'ty
1	E30580-1025A	Instruction Book	1
2	See page 23.	Warranty Card	1
3	E03614-004	FM Antenna (except Germany)	1
4	E67007-001	Wire Antenna (for Germany only)	1
5	BT20042	Service Procedures (for U.S. Military Market only)	1
6	BT20046	Service Information Card (for U.S.A. only)	1
7	BT20044B	Safety Instruction (for U.S.A. only)	1
8	BT20054-001A	FTZ Information Sheet (for West Germany only)	1
9	QPGA025-03505	Envelope for Instruction Book	1
10	E66416-003	Envelope for Warranty Card (for U.S.A. and Canada)	1
11	QPGA005-00703	Envelope for Fuse (for U.S. Military Market and Other Countries)	1

13. R-K20/R-K20L Schematic Diagrams

13-1) R-K20 Tuner Section



Printed Circuit Board Ass'y Locations

P.C. Board Ass'y	Description	Page
TFC-39	Tuner P.C. Board Ass'y	8
TDC-64	Logic P.C. Board Ass'y	11
TXX-400	Amplifier P.C. Board Ass'y	13

Notes:

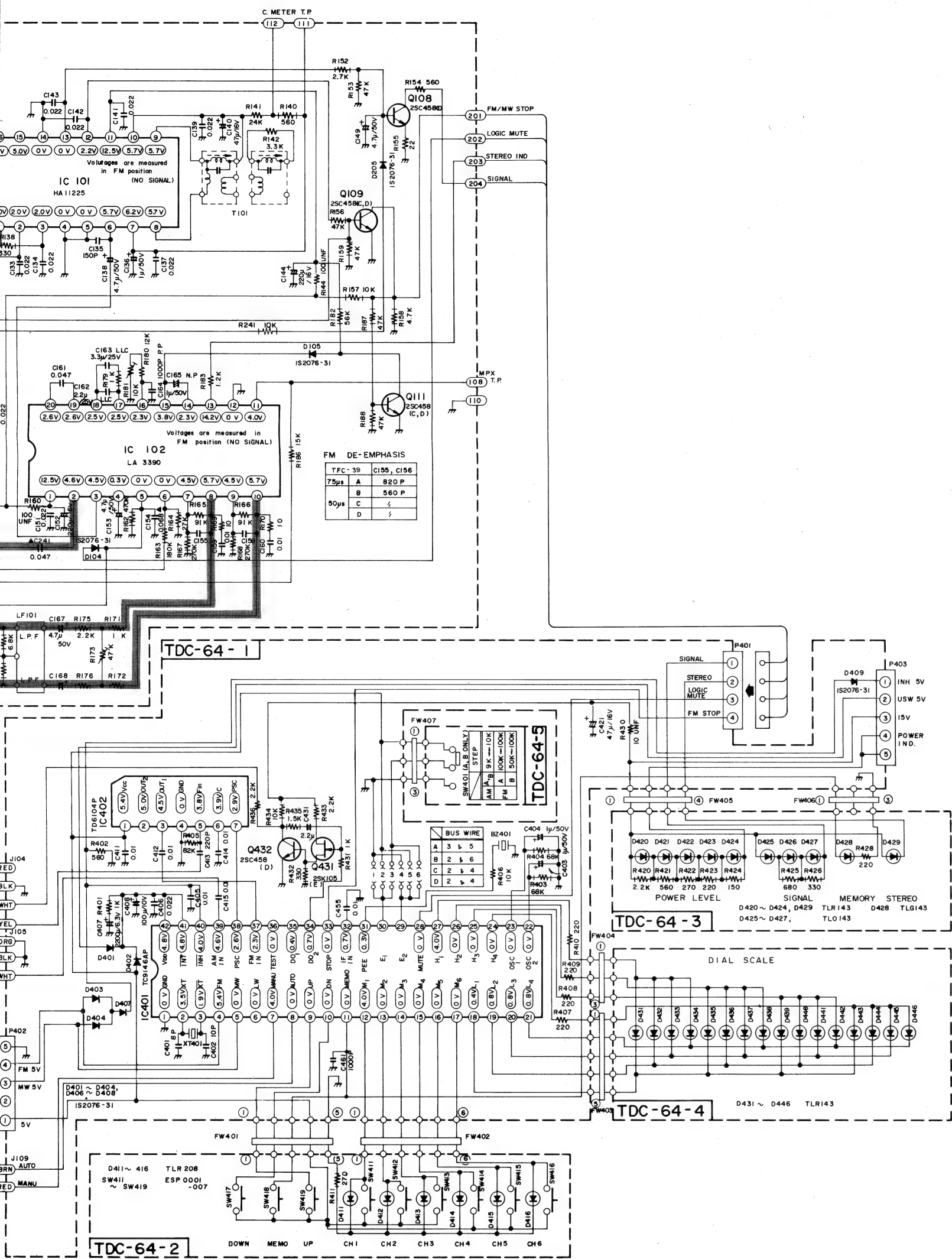
1. shows DC voltage to the chassis with no signal input.
2. indicates positive B power supply.
3. indicates signal path.
4. Parts in red indicate transistors or ICs.
5. This is the standard circuit diagram.

The design and contents are subject to change without notice.

D

E

F



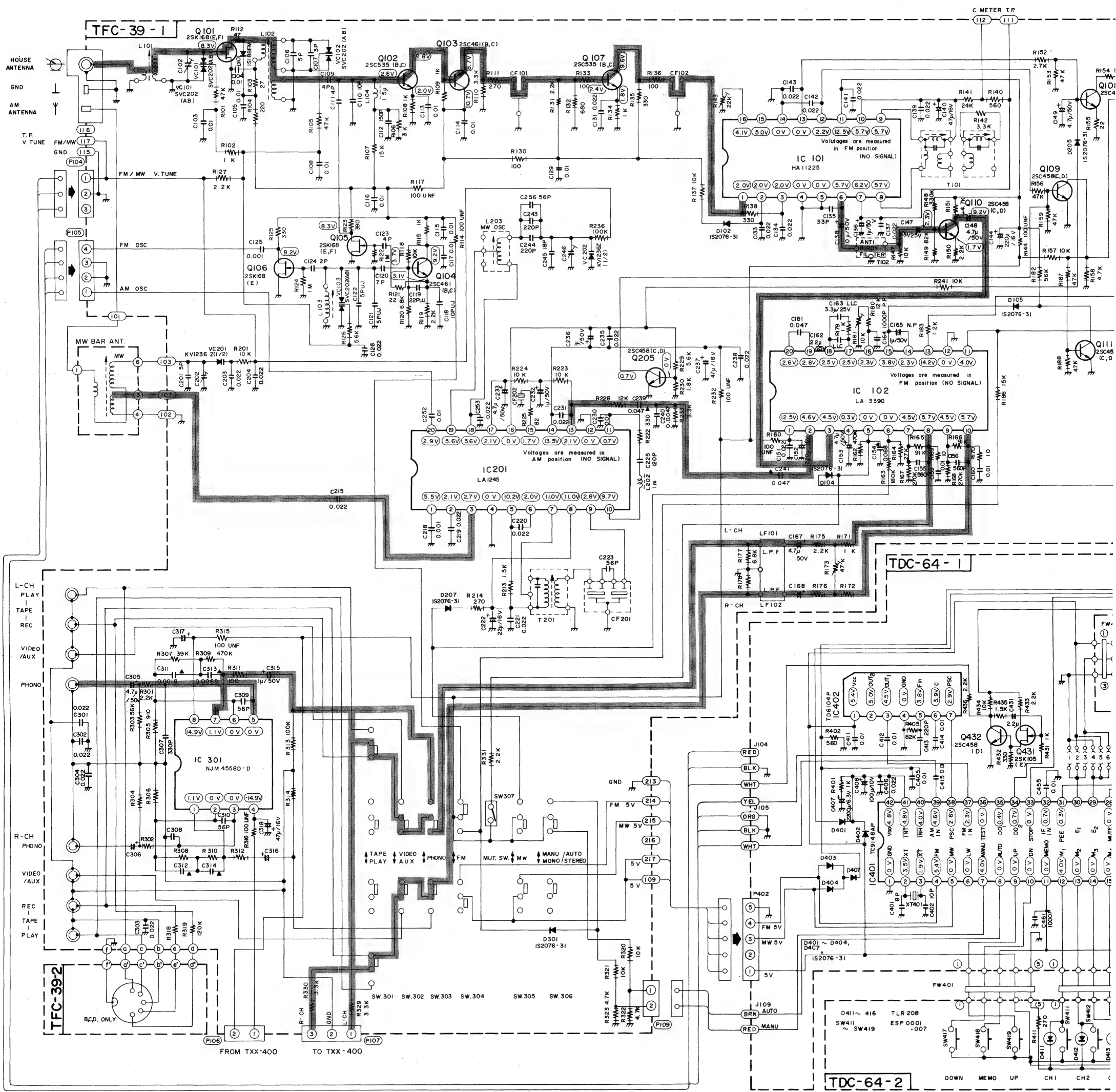
13-(2) R-K20 Tuner Section (for West Germany only)

A

B

C

D



A

B

C

D

Printed Circuit Board Ass'y Locations

P.C. Board Ass'y	Description	Page
TFC-39	Tuner P.C. Board Ass'y	8
TDC-64	Logic P.C. Board Ass'y	11
TXX-400	Amplifier P.C. Board Ass'y	13

Notes:

1. shows DC voltage to the chassis with no signal input.
2. indicates positive B power supply.
3. indicates signal path.
4. Parts in red indicate transistors or ICs.
5. This is the standard circuit diagram.
The design and contents are subject to change without notice.

D



- 20 -



13-(4) R-K20 Amplifier Section

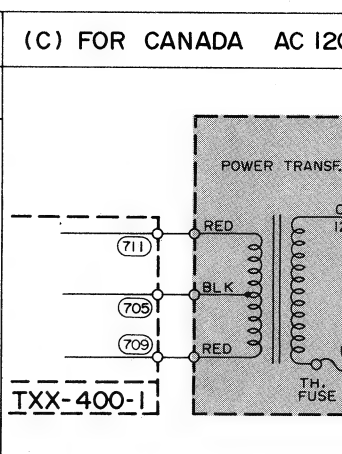
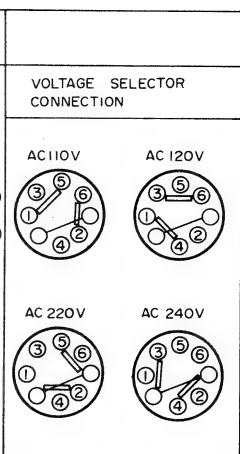
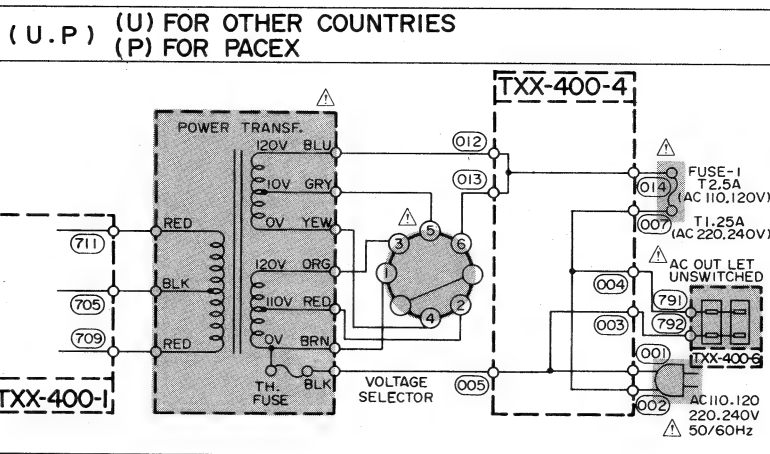
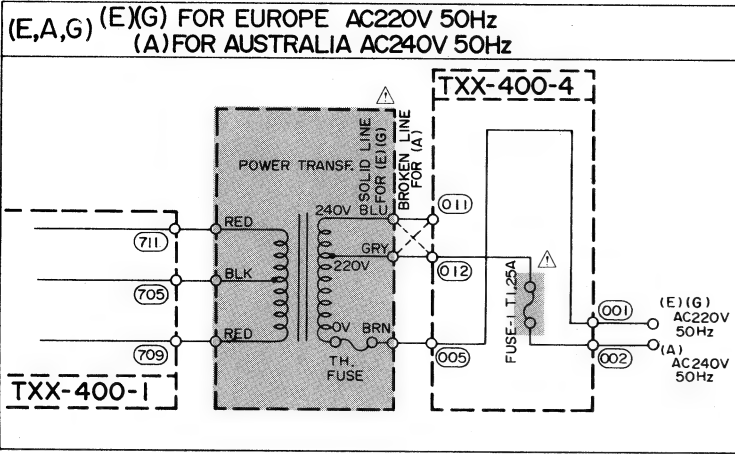
A

B

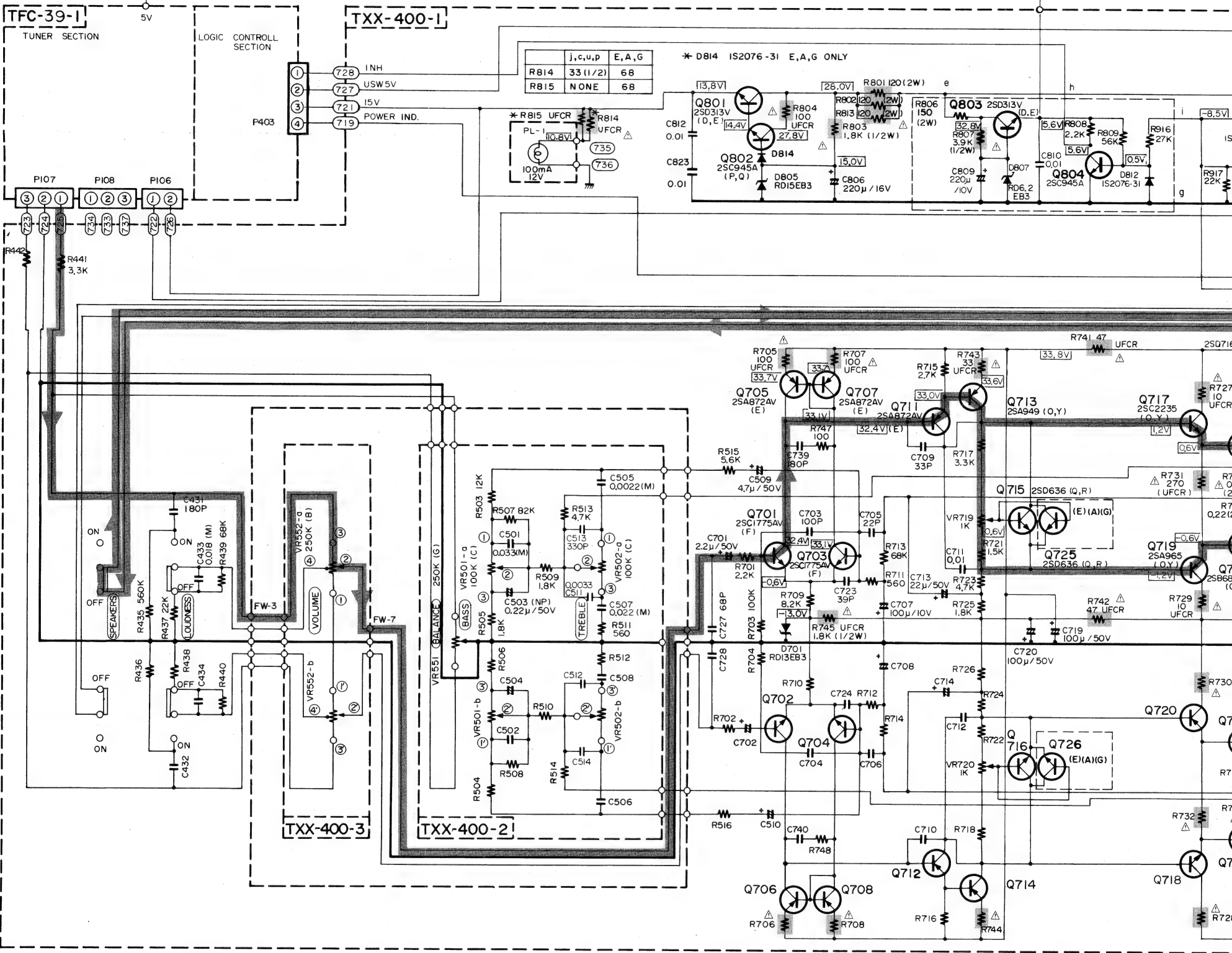
C

D

1



2



A

B

C

D

Printed Circuit Board Ass'y Locations

P.C. Board Ass'y	Description	Page
TFC-39	Tuner P.C. Board Ass'y	8
TDC-64	Logic P.C. Board Ass'y	11
TXX-400	Amplifier P.C. Board Ass'y	13

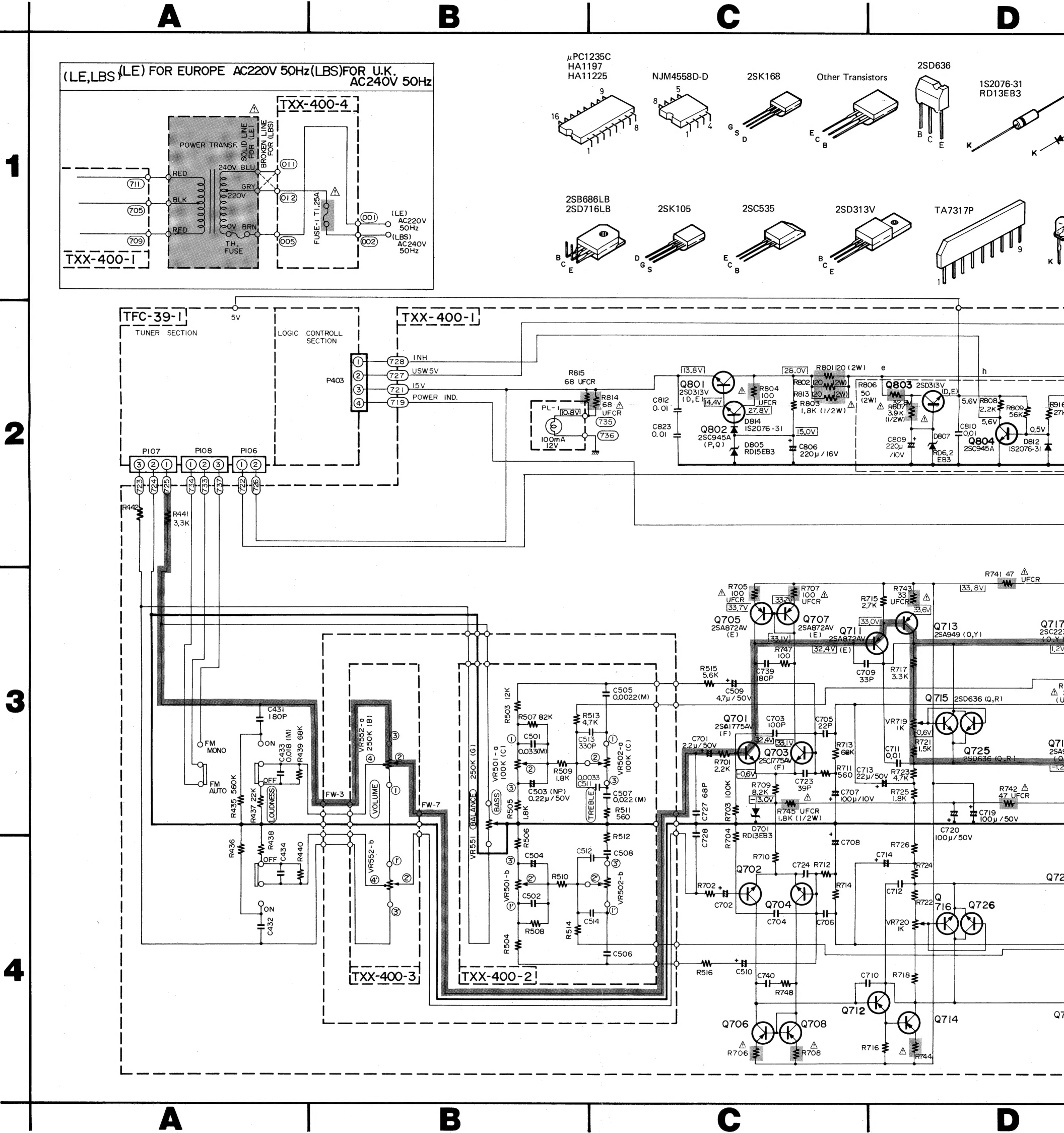
Notes:

1. shows DC voltage to the chassis with no signal input.
2. Voltage values in are positive.
3. Voltage values in are negative.
4. indicates positive B power supply.
5. indicates negative B power supply.
6. indicates signal path.
7. When replacing the parts in the darkened area (), and those marked with , be sure to use the designated parts to ensure safety.
8. Parts in red indicate transistors or ICs.
9. This is the standard circuit diagram.
The design and contents are subject to change without notice.

F

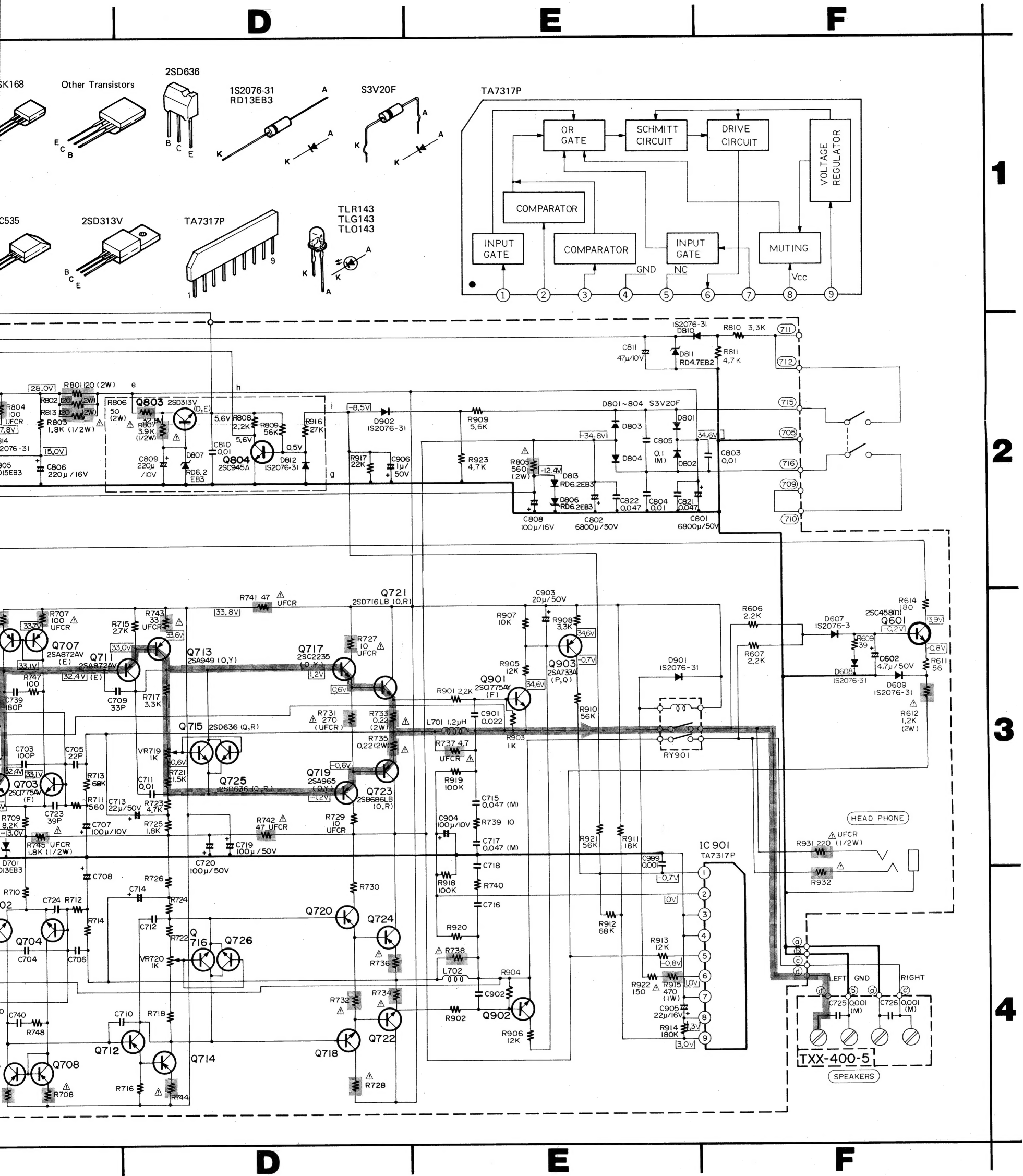
ge without

13-(5) R-K20L Amplifier Section (for Europe and U.K.)



Printed Circuit Board Ass'y Locations		
P.C. Board Ass'y	Description	Page
TFC-39	Tuner P.C. Board Ass'y	8
TDC-64	Logic P.C. Board Ass'y	11
TXX-400	Amplifier P.C. Board Ass'y	13

- Notes:
1. shows DC voltage to the chassis with no signal input.
 2. Voltage values in are positive.
 3. Voltage values in are negative.
 4. indicates positive B power supply.
 5. indicates negative B power supply.
 6. indicates signal path.
 7. When replacing the parts in the darkened area (), and those marked with , be sure to use the designated parts to ensure safety.
 8. Parts in red indicate transistors or ICs.
 9. This is the standard circuit diagram.
The design and contents are subject to change without notice.



13. Parts List with Specified Numbers for Designated Areas

Item No.	Description	U.S.A. and Canada	Europe and Australia	West Germany	U.S. Military Market and Other Countries	Europe (with LW)	U.K. (with LW)
	Front Panel Ass'y Dial Scale Top Cover	EFP-RK20E E302209-003 E24147-001	EFP-RK20E E302209-004 E24147-002 (for Europe) E24147-001 (for Australia) E23862-001 (for Europe only) E24145-002	EFP-RK20E E302209-004 E24147-001	EFP-RK20E E302209-003 E24147-001	EFP-RK20LE E302209-005 E24147-002	EFP-RK20LE E302209-005 E24147-002
	Grill	—	—	—	—	E23862-001	E23862-001
	Rear Panel	E24145-006	E24145-002	E24145-005	E24145-006	E24145-003	E24145-003
S001	Power Trans- former \triangle	ETP1100-02JA	ETP1100-02EA	ETP1100-02EA	ETP1100-02FA	ETP1100-02EA	ETP1100-02EABS
	Power Switch \triangle	QSP2206-001	QSP2206-002	QSP2206-002	QSP2206-002	QSP2206-002	QSP2206-002
	Power Cord \triangle	QMP1200-200	QMP3900-200E (for Europe) QMP2560-244 (for Australia)	QMP3900-200E	QMP7600-200E	QMP3900-200E	QMP9017-008BS
	Siemens Plug \triangle	—	—	—	E04056	—	—
	AC Outlet \triangle	QMC0437-002	—	—	QMC0437-002	—	—
F001	Voltage Selector \triangle	—	—	—	QSR0085-001	—	—
	Fuse Socket \triangle Fuse \triangle	— QMF61U1-2R5 (120V 2.5A)	— QMF51A2-1R25H (220V/240V 1.25A)	— QMF51A2-1R25H (220V 1.25A)	QMG0301-003 QMF51A2-2R5H (110V/120V 2.5A) QMF51A2- 1R25H (220V/240V 1.25A)	— QMF51A2- 1R25H (220V 1.25A)	— QMF51A2-1R25HBS (240V 1.25A)
J001 J901	Din Socket Headphones Jack	QMS6302-114	E03623-003 QMS6302-114	E03623-003 QMS6302-114	QMS6302-114	E03623-003 QMS6312-015	E03623-003 QMS6312-015
SW401	Bar Antenna Antenna Terminal	E03037-042M E03572-016	E03037-042M E03572-016	E03037-042M EMB91YV-201A	E03037-042M E03572-016	E03037-041M E03572-016	E03037-041M E03572-016
	Slide Switch Warranty Card	QSS2201-004 BT20048 (for U.S.A.) BT20025D (for Canada)	— BT20029C (for Australia only)	— —	QSS2201-004 BT20032B (for U.S. Military Market only)	— —	— BT20013C

\triangle : Safety Parts

14. Repair of Printed Resistor

- (1) When replacing a printed resistor, cut off the printing by a pointed tool as shown in Fig. 13.
- (2) Solder a new resistor in the pattern side as shown in Fig. 14.

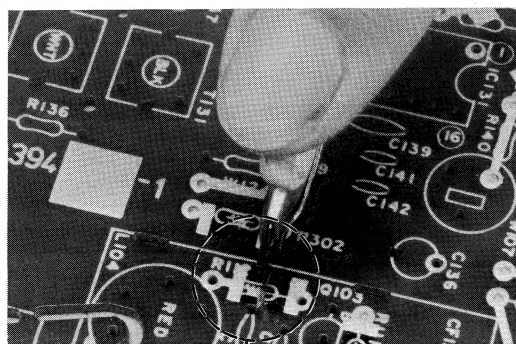


Fig. 13

Cut off the printing

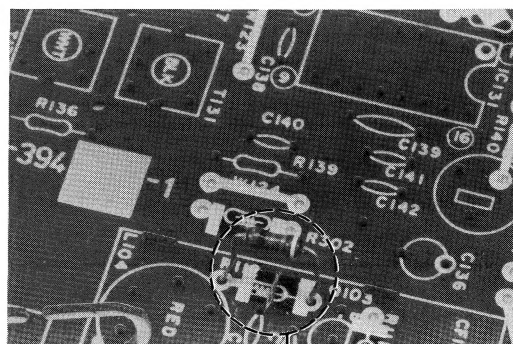


Fig. 14

Newly added resistor